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ABSTRACT

Collected in this digest are nine articles concerning education for child survival and development in Africa. Topics include: (1) the role of basic education in the promotion of child survival and development; (2) child health in Eastern and Southern Africa, including discussions of problems, interventions, and the role of education for health; (3) basic education for nutrition; (4) research issues in education for health; (5) health and the environment in Africa; (6) the Pied Crow's Environment Special Magazine, Kenya's innovative publication on environment and health for upper primary school students; (7) children as agents of change, with particular attention to water and sanitation issues; (8) basic development education in Ethiopia; and (9) child survival and development through environmental and population education. (RH)

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Continued on inside back cover

Digest 20

Education for Child Survival and Development in Africa

Contributions by

R. Kagia - T. Boerma - Z. Gabriel
J.X. Collins - J. Connor - P. Hetz
K. Nimpuno - S. Olana - P. Muyanda Mutebi

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PREFACE

Educationists throughout Africa are today concerned with the contribution which education can make in promoting the survival and development of children. For although recent scientific and technological breakthroughs have made it possible to dramatically reduce infant mortality and improve the lives of millions of children in the developing world, education remains a critical and often elusive component of any programme that wants people to accept, adopt and sustain new health practices.

Most of the contributions of this Digest were first presented at a regional seminar convened by the Unesco/UNICEF Co-operative Programme in Nazareth, Ethiopia, in 1985. This was probably the first time in Eastern and Southern Africa that curriculum planners of both formal and non-formal education met to interact with specialists in health, nutrition, environment, sanitation, and population.

Michael Kinunda, Regional Education Adviser for the Unesco/UNICEF Co-operative Programme, needs to be thanked for having arranged this seminar and suggesting to us that we publish its main papers.

Dieter Berstecher
Unesco/UNICEF Co-operative Programme
Unesco, Paris

28 October 1986

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THE ROLE OF BASIC EDUCATION IN THE PROMOTION OF CHILD SURVIVAL AND DEVELOPMENT*

'Behind us lies the thousand and the thousand and the thousand years vexed and terrible and still we use the cures that never cure'.
From a poem by Christopher Fry. A Sleep of Prisoners.

Introduction

There is little debate on the efficacy of education to change the human condition. A sufficiently wide data base now exists which shows that education does make workers more productive, that female education is inversely related to fertility, child morbidity and mortality and that education is a major catalyst for development. What is less clearly understood is how this change actually takes place - what is in education that brings about this change?

If education is a *primus inter pares* in development, then basic education must be a pre-requisite in the promotion of Child Survival and Development (CSD). But the relationship between education and CSD cannot be linear. Today, so many children die from avoidable causes and those who survive live in squalor, malnourished and sickly that the phenomenal growth in educational systems over the last two decades must have been largely unresponsive to the needs of children. This does not necessarily decry the potency of education but it does cast doubts on the effectiveness of the overall development strategies of that period. It is the expression of such doubts, in the last few years, which has led to

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* By Ruth Kagia, Consultant to UNICEF, Regional Office for Eastern and Southern Africa.

a fundamental shift in development strategies and which, it is hoped, will lead to a reversal in the downward trend in socio-economic growth which has been a main feature of many countries during the last decade. As part of this shift, both the concept of basic education and CSD have changed dramatically from being two major but parallel developments to a point where they now intersect in their strategies and their goals. This intersection is a decisive point which can determine the direction and pace of development over the next two decades.

The combined impetus derived from the recession, research evidence of the last fifteen years and the increased global social rapprochement offers hope for an accelerated pace of development. CSD is poised, not just for a faster pace, but for a 'quantum jump' which entails the reduction of infant mortality rates to 50 or less and a raise in life expectancy, for everybody, to at least 60 years by the year 2000. Basic education offers countless opportunities to attain this goal. But perhaps its greatest role in this context will be the synergetic effect it can create with CSD to build a buffer against further deterioration of the child's condition and by turning vicious cycles in CSD into virtuous cycles. None of this, however, will happen by accident. It will be the result of careful management of the existing resources, material and human, in both basic education and CSD.

'It's easy for a developing country to go from the ox-cart to the jet age. But in the process it leaves 90% of its people behind'. Quoted in World Health Forum, UNICEF News No. 117, 1983.

The Setting

At a global level, the central thrust of development has shifted from an emphasis on economic growth to improvement of the individual's capacity to shape his destiny. This change is the result of a retrospective realization that the economic development model, as postulated in the last three decades, was fundamentally deficient. The deficiency

lies in the assumption that social progress would follow more or less automatically as a result of economic growth and that development was a cluster of benefits which could induce progress if transferred from a developed nation to one which is less developed.

It is tragic that when many African States became politically independent in the 1960s, this is the model they adopted for the development of the new states. Throughout that decade, modernization and westernization were confused with progress and growth and the continent became a fertile transplanting ground for ideologies, technologies and industrial models from all parts of the world. In less than a decade, however, it became clear that development had veered off the track. Unemployment rates were rising, social inequalities increased, the fast population growth turned all goals into moving targets and the resources dwindled. From the mid 1970s, most of the African states were ardently searching for effective paths to development -hence all the 'innovations' characteristic of that period, such as diversified education, basic education, the basic services approach, primary health care, etc. A common element in these and similar efforts is that they are indigenous responses to felt needs in a community. With varying degrees of awareness, many African states began to recognize that stereotyped development patterns taken from different historical backgrounds were ill-suited to the needs and aspirations of their people and that, ultimately, their destiny lay in their own hands.

But it was the 1980-83 recession which finally turned the unorchestrated disenchantment of the 1970s into an urgent and integrated global concern. This was because: 'The recession of 1980-83 was the longest in fifty years. It increased unemployment, reduced investment, and undermined social programs in almost every country in the world. It put great strain on international trade and financial systems and caused friction between governments everywhere. But it provided many valuable lessons for economic policy because it highlighted longstanding weaknesses in every economy and international arrangements. (World Development Report 1984, p. 1).

The recession jolted the world into accepting a few realities. The first is a recognition of the interdependence of all economies both strong and weak. When a catastrophe, such as the recent famine in Ethiopia, hits one country its ripple effect extends way beyond its borders. The recognition of this interdependence, lop-sided as it may be, has made it possible for nations around the world to embark on a joint search for solutions to underdevelopment. Secondly, it has become critical to manage resources more effectively if human progress is to be maintained in the absence of a foreseeable increase in resources. And thirdly, and perhaps most important, was a more universal recognition of the centrality of the human component in all development issues. In the 1980 International Development Strategy, for example, the objectives of social and human development were accorded a new emphasis. Similarly, in the 1983 World Development Report, a whole section is devoted to management issues, touching on aspects such as efficiency, people-centered development, and the cultural component.

This, then, is the backdrop against which the Child Survival and Development Revolution (CSDR) has been launched. It is a background that offers limitless possibilities and at the same time innumerable challenges. While there may be a concerted global fight against underdevelopment, the most effective fight is that which is conceived from within a community. The diversity of communities, even within one country, defies national, to say nothing of global generalisations. In the same way, while the centrality of man in development is irrefutable, it is a strategy that is extremely frustrating to manage. People-centered development is so multi-faceted and so amorphous that it offers formidable challenges to planners. Finally, to maintain human development without adequate resources requires innovative approaches, resourcefulness and vision. Consequently, only time will tell whether the paths taken today were successful or not.

Give me the child until he is 7 and I will give you the man.

The Problem

Despite the progress made in the development of services for children and despite impressive advances in the medical and other sciences, the magnitude of unmet basic needs of children is staggering. The combined effect of rising birth rates and low economic growth is to widen the gap between unmet needs and available resources. As can be seen from appendix I, economic growth rates have stagnated or dropped in most of the countries in this region* while all but one of the countries have total fertility rates of 6 or more. In effect, the plight of children in Africa continues to deteriorate. For example:

- In 1981, a child died every 2 seconds -a total of over 40,000 children every day. Three fourths of these deaths were in Africa and South Asia. In this region alone, close to 2,000 infants die each day.

- 200 million 6-11 year olds are not in school. On average, 73 per cent of women in this region are still illiterate.

- Before the drought, 25 per cent of the under fives in Sub-Saharan Africa were malnourished.

Clearly, it is not enough to maintain past rates of progress. Given the pace of population growth, such an effort would, at best, succeed in maintaining the status quo. To reverse tne trend, it is necessary to increase past rates of progress at least threefold. The social targets for the year 2000 include achieving health for all, and lowering of infant mortality rates to 50 or less which would

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* Unless otherwise stated, region refers to the Eastern and Southern African Region.

in turn raise life expectancy to at least 60 years. As can be seen from appendix 1, between 1960-1982, IMR rates fell an average of 40 points in this region. Only through a revolution can they fall another 50 points in the next fifteen years. The issue is what can basic education do to promote this revolution?

To create change in one year, plant rice.
In ten years, plant trees.
In a hundred years, teach men.

Ways in which Basic Education Can Promote CSD

Basic education is the minimum provision of knowledge, attitudes, values and experiences which should be made for every individual and which should be common to all. It is aimed at enabling each individual to develop his potentialities, creativity and critical mind for effective participation and service to his community. It is perceived less as a minimum package with the implicit close-endedness and self-sufficiency of that term, and more as a springboard, an initial force, for lifelong education.

Although there is a tremendous diversity in the interpretations given to basic education in this region, four main components are identifiable in each country. These would be the main channels which need to be strengthened in order to promote CSD more effectively.

Early Childhood Education

The first five years of a child's life have been identified as the period of the most rapid growth in physical and mental characteristics and of the greatest susceptibility to environmental influences. 90 per cent of the human brain and 50 per cent of the body grows in these first five years. The sensitivity of this period to any intervention makes early childhood education a major entry point for CSD. During this period, many important bridges concerning the child's welfare can be built between home and school.

The Primary School

All countries in this region include primary schooling in their concept of basic education and hold the view that primary schools are the principal medium for educating the young. One of the main advantages of using the primary school for the promotion of CSD is its ubiquitousness. An estimated 25% of the population in this region is of primary school-going age. It can be reasonably estimated that every neighbourhood will have one or more children in primary school. Any information conveyed through these children, therefore, can be widely disseminated. Secondly, in many communities, the primary school forms the only nucleus of educated people and is a powerful instrument of change. In such cases, teachers enjoy tremendous respect from the community, they are the main advisors and principal agents of change.

A further advantage of using the primary school is because it provides long-term exposure during an impressionable age. If CSD issues are well taught during this period, the impact can be long-lasting and sustained into the next generation.

Non-Formal, Functional Literacy and Post-Literacy Programmes

Under this heading are included all organized learning activities outside the formal school system. Some of these have been designed to offer basic education, usually just numeracy and literacy, to adults who for, whatever reason, failed to get it in their childhood. Others are post-literacy programmes for adults and youth who dropped out of school before they were functionally literate. This is an important group, if only because it is so large. As can be seen from appendix 1, 7 of the countries in this region, have a primary school drop-out rate of 50 per cent or more. The third set of programmes in this category offers post-literacy education to the neo-literates designed to sustain their learning skills. These programmes can tackle CSD issues more directly and they can produce results more immediately particularly where there is a high female clientele.

Table 1 is a schematic outline of some of the ways in which basic education can promote CSD. It is assumed here that its role in equipping the learners with the tools of the trade-numeracy and literacy, in changing attitudes and imparting specific knowledge, is so obvious that it does not need further elaboration. There are, however, two less overt effects of basic education which are, potentially, even more powerful and which have not been effectively demonstrated in this outline.

Table 1

WAYS IN WHICH BASIC EDUCATION CAN PROMOTE CSD

CSD PROBLEM	SOLUTION	WHAT BASIC EDUCATION COULD DO
1. Retrogressive social attitudes - apathy - fatalism - dependence - resistance to change - introverted view of life	Make community the focal point of development e.g. participate in identifying, designing and implementing projects Empowerment particularly of women	Basic education is that which takes an individual or a community to the "threshold of self-sufficiency..." by providing: - the tools of the trade -numeracy and literacy. - knowledge - why? what? how? - attitudes - iniquisitiveness, manipulation, observation, resourcefulness, adaptability, etc. - confidence and desire to shape one's destiny.
2. Maternal inadequacy - malnutrition and debilitation - too many close births - overwork - ignorance - adolescent pregnancy	Food and vitamin supplements family planning Reduce maternal burdens e.g. by bringing water to homes	Give knowledge of importance of a healthy uterine environment for baby as well as the basic health needs of children. Create positive attitudes towards family planning. Increase confidence of mother by making her feel she is in control of her child's life. Sex education-raise consciousness about sexuality, ethics, morality.
3. Malnutrition caused by - food shortages - poor eating habits - premature weaning from breast - inappropriate weaning practices - nutritional set-backs caused by infections	Increase food production Change food habits GOBI	Basic knowledge of: - malnutrition, cause and prevention. - a balanced diet. - child nutrition. Basic skills in agriculture. Positive attitudes towards good health.
4. Communicable diseases - poor sanitary/environmental conditions e.g. overcrowded housing, use of unclean water - lack of knowledge about preventive medicine	Immunization Improve quality of life	Increase receptivity towards immunization give skills that enhance income generating activities. Give knowledge of causes and prevention of disease. Change practices e.g. do not withhold food when child has diarrhoea.

Educational Components in Other Basic Services

These are programmes designed by sectors other than education to promote specific educational aspects which are considered important for them, for example, extension programmes in agriculture, family planning, and maternal and child health educational programmes. All these can enforce CSD messages which are relevant to their sector.

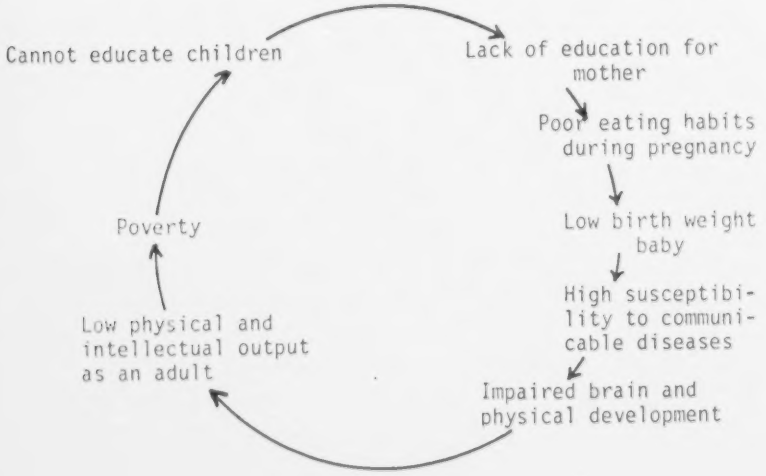
The first is the effect basic education can have through the 'hidden' curriculum. The choice of stimulus material, such as exercises in mathematics or reading passages in language, often reflects unconscious as well as conscious biases of the system. There is plenty of research evidence which shows that these biases are as important in shaping learning attitudes as is the 'real' curriculum. It has been convincingly argued, for example, that part of the reason girls perform poorly in mathematics is because most of the textbooks project the image that mathematics is predominantly a male domain. This is an interesting area to explore during the social marketing of CSD. It can be approached from two angles:

- by re-orienting stimulus material towards CSD; take, for example, the following phrase: 'Mariam's baby weighed 3 kg when he was born. After 6 months, his birth weight had doubled. After another 6 months he had added 3 kg more. How heavy was he on his first birthday?' This question, which is an exercise in basic multiplication and addition, also provides some vital information on normal weight gain (a baby normally doubles his birth weight in the first six months and triples it by the end of his first year). It could be argued that the learner may not even notice that an important CSD concept has been introduced in the question. This would be unfortunate, but in the event that he notices it, albeit, sub-consciously, it will enhance his receptivity to child growth issues, possibly many years later.

- by 'charging' the learning environment with CSD issues; in Africa, very few people read outside the school system partly because there is such little interesting reading material but also because there is often no

need to read, as much of the needed information can be communicated orally. Any CSD information in the form of charts or captions in textbooks channelled through the school will certainly be read and this will also help to 'charge' the atmosphere with CSD issues.

The second is the synergetic effect which basic education can create when it is effectively geared to CSD. This can be illustrated using the example of lack of maternal education on the development of children.


Cannot educate children
Lack of education for mother
Poor eating habits during pregnancy
Low birth weight baby
High susceptibility to communicable diseases
Impaired brain and physical development
Low physical and intellectual output as an adult
Poverty

The potential which basic education has to turn this vicious cycle into a virtuous cycle is perhaps its greatest contribution to CSD. This potential is particularly high in the case of maternal education as can be seen from the examples of co-efficients of correlation (rank order) below.

Adult female literacy and child death rate	$R^2 = +0.8416$
Adult female literacy and life expectancy at birth	$R^2 = +0.8944$
Adult female literacy and infant mortality	$R^2 = +0.8500$

Source: A.W.P. Guruge and J. Ryan (1984).

Such high correlations indicate that female education may easily be the single most important determinant of CSD. However, a question raised by this statement is how much education and of what type is required to produce such high effects? At what point should it be given?

It could be argued that the relationship between female education and child welfare is really a proxy for other social factors. This is an important area for research.

While all educators subscribe to the idea of incorporating elements of CSD into their programmes, they are not as united when it comes to the nature and details of this incorporation. At a sub-regional consultation on health in schools held in Bangui in 1983, revealing comments were made about the kind of promotion CSD is seeking from education:

> *"The status of health teaching in schools should be similar to that of other important scientific topics, eg physics, mathematics, biology, etc. Among the alternatives for raising the status of health courses would be the establishment of compulsory examinations."*

This is much more than many educators are willing to admit. Already, there have been so many major changes in curricula that many educational systems have not yet stabilized. Some educators feel that curricula are overloaded and that the trend should be towards narrowing them down to a common core. Already, many of the CSD elements are taught as part of home science or the natural sciences. The issue here is how adequate is this coverage? Can it be strengthened without making the time-table heavier?

A further attitudinal hurdle may be finding the rightful place for CSD in the curricula. The 1980 UNICEF Survey of Basic Education in Eastern Africa indicates that there are only three areas on which all countries in the region uniformly place high priority. These are numeracy and literacy as well as simple agricultural skills (see appendix 2). This is not surprising, given the agrarian nature of the region and the centrality of the three R^S in education. CSD cannot, therefore, easily assume any higher priority than these three, either in terms of time or resource allocation. It could however, exploit the priority to these three, for example, by becoming the stimulus material for reading and computing.

Partly structural and partly attitudinal is the issue of teachers. Already there exists a dearth of trained teachers even in those subjects which have traditionally been considered important. CSD does add to an already difficult problem. The teacher training curriculum is already very heavy. In Kenya, it includes 13 subjects and it is possible to justify a few more. Secondly, the systems have not yet managed to train as many teachers as is required. Thirdly, the widespread changes in the syllabi across the region have entailed major re-orientation on the part of teachers. The challenge is to re-train teachers in view of the changes in education without making the re-orientation so drastic that they feel that none of their 'old' knowledge is relevant, thereby undermining their confidence. How can the CSD themes be introduced to teachers without further weakening their shaken confidence? These last three caveats underline the importance of introducing CSD not as a new and additional topic but rather as a way of focussing on important issues which are already in the syllabus.

An underlying assumption in the foregoing is that learners master and retain what they learn. Obviously this is often not the case. A review on effectiveness of schooling concludes:

> *'The level of reading comprehension of both 10 and 14 year olds in developing countries was surprisingly low. Significant numbers of even the 14 year olds had to be considered semi-literate. They did not approach being able to read and understand national newspapers...'* (Simmons, 1975).

In the 1981 CPE Newsletter produced in Kenya, it was pointed out that there were 13,000 candidates who scored one or two marks. The compositions written by these candidates could not be recognised as English. These 13,000 pupils had had seven years of primary education. How much worse is the situation for the early drop-outs or for those in adult literacy classes who attend classes for a year or less? The challenge is to ensure that CSD elements taught through formal education are not so poorly mastered that they have no functionality.

So much information exists that learners are no longer expected to retain it in their heads, but rather to know when and how to get it. The role of education is to give the necessary tools and skills for accessing and utilizing this information. Hence the need to search for the best tools and skills since the information needed today may be irrelevant tomorrow. This search involves identifying what it is about education that makes the difference. What forms of education have what types of influence under what conditions? This is a major area of collaborative research between proponents of basic education and the Child Survival and Development Revolution.

But how immediate is the impact of basic education on CSD? To answer this question effectively, it may be instructive to ask why Africa has made such little social progress over the last twenty years. It is not just because the development models were deficient. Some countries had sound and potentially very effective social programmes. Tanzania is a case in point. Why in spite of decentralisation, universal primary education, indigenization of language and so many other viable revolutions has this country not progressed faster? It is hypothesized that this is because social progress is an evolutionary process which cannot be rushed. Tanzania should, in the next decade, make incredible 'social leaps' once the social programmes have percolated to the depth of society. In a similar way, it is felt that, whereas CSD will make some impact on child deaths and child health in the next fifteen years, the real torch-bearers of CSD and similar social revolutions are today's children whose real impact will not be felt for another generation. What are the implications of this argument for the promotion of CSD?

Challenges for the Future

While basic education offers limitless possibilities for promoting CSD, it will only do so effectively if the interventions are properly thought out. This can be done in several ways.

The first is a clear understanding of the current situation in each country as it pertains to CSD. This involves an understanding of the social milieu, structural idiosyncracies, and the level of health awareness and health needs. The on-going publications of the country situation analyses of women and children are one effective way of increasing this understanding. While these documents are invaluable in putting together hitherto uncoordinated information, more specific analyses are required to provide data on issues such as: what is the greatest cause of child deaths in a particular district? What health attitudes and values can constrain or facilitate the promotion of CSD? What means have the various governments employed to mobilise their people and in what ways can such mobilization assist the promotion of CSD?

It will also be necessary to monitor progress very carefully. Breast-feeding as advocated in CSD will undoubtedly improve child health but it needs to be supported by a social infrastructure that makes it possible for mothers to breast-feed as they work. Food supplements, also a worthwhile endeavour, have to be monitored carefully so that they benefit those most in need without increasing dependency by the recipients.

Perhaps the greatest challenge of all will be how to break the sectoral barriers. Basic Education, for example, as it has evolved in Eastern Africa is under several Ministries - most of it under the Ministries of Education, but major components such as Adult Education under other Ministries. The success of CSD heavily depends on how well all the efforts from all the sectors enhance each other. How can the existing barriers be broken?

Finally, CSD must at all times be advocated in the context of the wider social realities. The underlying causes

of higher female illiteracy rates have to be understood and addressed. In the same way the amelioration of economic causes of malnutrition or early weaning is as important as the raising of awareness. It is this all-encompassing nature of CSD which is both its greatest strength because it can have such a far reaching impact, but also its potential weakness in that it is so difficult to chart out a neat course of action.

Conclusion

Basic education will have failed in its most important role if it does not intervene in the crisis of child development and survival. This is not purely emotive challenge. In this region where 71 million people, nearly 50 per cent of the population, are children under the age of 15, this intervention can determine whether those children become a liability or a resource over the next three decades. This paper should have made it clear that basic education can do much more than it is doing at the moment. Until now, health issues were not given as much priority in education as agriculture or technology partly because the health sector had perhaps underestimated the potential of basic education and, therefore, failed to incorporate it adequately in its programmes. Now that this has changed the challenge to educators is to make sure that the hope which CSD offers for today's children and tomorrow's adults is not thwarted by conservative attitudes, self-interest of specialists and scepticism.

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APPENDIX 1: Basic Data for the Eastern and Southern Africa Region

Country	Infant Mortality Rate ages 0-1		Life Expectancy at birth (years)		% of Adults Literate male/female		% of grade 1 Enrolment completing primary school 1975-82	Total Fertility rate	GNP per Capita average annual growth rate %	% Population below absolute poverty level 1977-1981	
	1982	1960	1982	1960	1980			1982	1980-1983	Urban	Rural
Botswana	80	110	54	45	61	61	78	6.5	6.6	40	55
Burundi	140	170	44	38	35	13	47	6.4	-1.5	55	85
Ethiopia	140	180	43	36	-	-	50	6.7	-0.1	60	65
Kenya	80	140	53	42	61	38	44	8.1	-1.3	10	55
Lesotho	110	140	49	40	58	81	34	5.8	1.2	50	55
Madagascar	70	110	49	41	68	55	50	6.1	-6.0	50	50
Malawi	170	210	45	36	48	25	25	7.0	0.0	25	85
Mozambique	110	160	49	40	36	18	9	6.1	-5.1	23	-
Rwanda	110	150	49	42	61	39	48	7.3	1.6	-	-
Somalia	140	180	43	36	11	3	33	6.1	1.7	40	70
Swaziland	130	150	48	-	64	58	68	-	-3.8	-	-
Tanzania	100	150	51	41	12	31	76	7.1	-6.5	10	60
Uganda	90	140	52	43	50	29	78	6.9	-5.8	-	-
Zambia	100	150	51	42	79	58	80	6.8	-1.8	25	-
Zimbabwe	70	120	55	45	77	61	-	6.6	-2.9	-	-

Source: The State of the World's Children 1985 and Within Human Reach 1985.

Appendix 2 below summarizes the categorization of subjects by priority attached to them. The point to note is that some aspects of health are fairly low priority and are not well taught.

APPENDIX 2: Adequacy of Primary School Programmes in Relationship to the Desirable Components of Basic Education

High priority subjects		
Well taught	1.	Language
	2.	Number
Fairly well taught	1.	Physical and health education
	2.	Home economics
	3.	Social, civic and political education
Poorly taught	1.	Environmental education
	2.	Basic agricultural skills
	3.	Basic technical skills
Medium priority subjects		
Fairly well taught	1.	Local/national history/ geography
	2.	Basic knowledge of science
	3.	Religious education
Poorly taught	1.	Moral education
	2.	Traditional arts and crafts
Low priority subjects		
Poorly taught	1.	Traditional music, dance and drama
	2.	Vernacular literature
	3.	Family and sex education
	4.	Basic commercial skills

Source: Survey of Basic Education in Eastern Africa, 1980.

2

CHILD HEALTH IN EASTERN AND SOUTHERN AFRICA: PROBLEMS, INTERVENTIONS, AND THE ROLE OF EDUCATION FOR HEALTH*

One of the major purposes of this Seminar is to examine the role of basic education in promoting Child Survival and Development (CSD). The Seminar will focus on how primary education and non-formal education, particularly adult literacy and post-literacy programmes can be reoriented and strengthened so that they contribute towards the solution of urgent problems of infant and child mortality, ill-health and malnutrition and destruction of the environment.

Therefore, it is necessary to be familiar with:

- the present trends and perspectives regarding child mortality, morbidity, and malnutrition in Africa;

- the possible interventions to improve child health, for example, primary health care or the child survival and development revolution (CSDR). CSDR encompasses a number of simple interventions, which are the basis of UNICEF's strategy to reduce infant and child mortality and morbidity.

Once the problems and possible solutions have been identified, the role of basic education can be discussed.

The Problem of Child Health

The number of children under the age of 15 will increase considerably during the next decades. In 1980, there were

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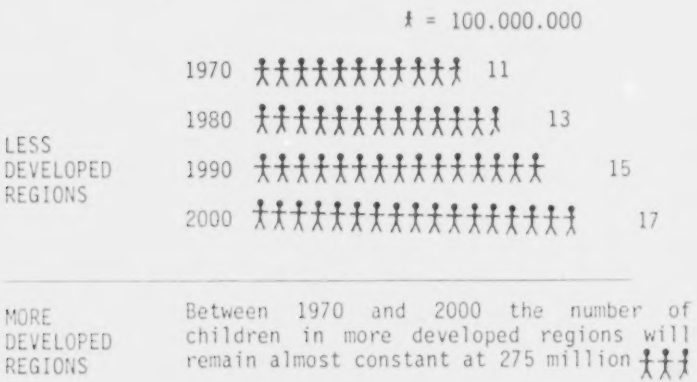
13 hundred million children in the less developed countries of the South, and this number will be approximately 17 hundred million by the year 2000. The industrialized and well-developed North has just under 3 hundred million children and this number will remain almost constant.

Figure 1: Children under fifteen



Source: UN Population Division. ESA/P/WP 65 N.Y. 1980

If the age of all deaths in these two broad groups of countries is considered, large differences can be observed. For those in the North, as well as the elite in the South, 80% will not die until they have reached retirement age of 65. In the South, 75% will die before they reach the age of retirement and in many countries half of these will be children.

The majority of child deaths takes place before the child reaches the age of 5. For Africa as a whole, it is estimated that 18% of the children born alive do not reach their fifth birthday. 11% die in the vulnerable first year of life and an additional 7% in early childhood. In the developed countries only 2% die in the first 5 years of life, mainly during the first month of life.

Table 1: IMR Estimates - 1983

Malawi	163
Ethiopia	155
Mozambique	153
Somalia	155
Rwanda	132
Tanzania	115
Zambia	88
Kenya	80
Zimbabwe	80
Botswana	76
Developed countries	17
Target 'Health for All by 2000'	50

Table 1 shows the estimated infant mortality per 1000 live births for the countries represented at this Seminar. Malawi, Ethiopia, Mozambique and Somalia are among the ten countries with the highest mortality rates in the world. Rwanda and Tanzania also have infant mortality rates above 100, whereas Zambia, Kenya, Zimbabwe and Botswana have some prospect of achieving the target of 50 per 1000, which is a target of "Health for All By the Year 2000".

The figures imply that in these ten countries, about 500,000 infants and 200,000 children aged 1-4 years died last year. The majority of these deaths are not due to complicated medical syndromes but to preventable causes: diarrhoea, acute respiratory infections, measles, mostly in combination with malnutrition, including low birth weight. In some areas, malaria and neonatal tetanus are also leading causes of death.

The high level of mortality is simply an indicator of the burden of morbidity and malnutrition of the children. Children are often sick and have a low nutritional intake. Growth of the child is probably the best indicator of such problems as the growth is affected by both nutrition and infections. If the child is ill, he eats less, absorb less and needs more because of fever and infection. If the child is under-nourished and becomes sick, the disease lasts longer and the risk of serious complications (and death) is higher. The prevalence of low weight-for-age in Africa is very high.

In a few countries such as Malawi, Ethiopia and Angola, more than 30% of the children are malnourished, in most of the countries, 20-29% are malnourished and in very few countries, such as Botswana, Lesotho and Swaziland, less than 20% are malnourished: over 6 million in the 10 countries.

Malnutrition is defined as below 80% weight-for-age of the WHO/NCHS standard. The malnutrition does not refer to the classic cases of kwashiorkor or marasmus, but to a combination of chronic and acute malnutrition.

What should the health sector do to improve the survival chance of all these children? First of all, one should look at the resources available. At the beginning of the decade, the North was spending a median figure of US $220 per head on health. In the South, the median expenditure was US $4, and half of these countries are spending less than this sum.

Figure 2: National Expenditure in Health/Person/Year

Median figures for 32 more developed and 92 less developed countries

Source: Health Sector Policy Paper, World Bank 1980.

In addition, most of this money was spent on curative doctor-oriented services. A major part of the budget is

spent on prestigious health projects including large hospitals and specialized health care. Basic health services in the rural areas are limited and little money is spent on them, as the results are difficult to perceive. Unfortunately, the large teaching hospitals or disease palaces are self-perpetuating. They are run by and create doctors who are particularly interested in specialized high technology care, and incapable of providing appropriate teaching in the community.

Interventions

A number of the aforementioned problems were the basis of the declaration of Alma Ata in 1978 where the Primary Health Care (PHC) strategy was defined and later adopted as the key approach. Basic ideas underlying the PHC concept are:

- 80% of the people do not have access to basic health services -a sign of profound inequity;
- the basic causes of ill-health are socio-economic and, therefore, need an intersectoral approach;
- people's participation in health has been neglected in the past, whereas community participation should be the focus of all activities; and
- the majority of diseases are preventable and low-cost simple technology is available for a rapid improvement.

UNICEF's policy is focussed on the latter. UNICEF has attempted to identify priorities which can be managed, both in terms of what countries can afford, and what their existing staff can afford and achieve. The emphasis is on low-cost simple health measures which are assumed to be able to cause a rapid improvement in child health. This is called the Child Survival and Development Revolution (CSDR), which consists of a number of priority health measures: growth monitoring, oral rehydration, breastfeeding and immunization (GOBI), as well as the three F's, food supplements to high-risk groups, family or child spacing, and female education.

Oral Rehydration

Diarrohea is very frequent in developing countries, and it is estimated that each child will have 10 significant attacks between birth and the age of five. The frequency is particularly high during the second half of the first year of life and during the second year of life. This period coincides with the weaning process.

The most common complication of diarrhoea is dehydration due to loss of fluids. About 10% of children with diarrhoea become dehydrated and one of those 10% dies.

The treatment of diarrhoea must, therefore, be focussed on the prevention of dehydration. Drugs are seldom necessary, but often it is the single therapy given. Diarrhoea must be considered as a self-limiting process, which is necessary to clean the intestines from micro-organisms and only in cases of special diseases such as shigella or cholera infection, will antibiotics slightly shorten the duration of the illness.

It is crucial, however, to give the child extra fluids, preferably with salt and sugar in the correct amounts. Oral rehydration salt packets are available all over the world.

Home-made sugar and salt solutions are very effective as well, particularly in the early stages of diarrhoea.

Oral rehydration is particularly useful in the community, but it is also essential in hospitals. The introduction of oral rehydration may greatly diminish both the expense of hospital admission and also reduce the mortality many times. As hospitals and health workers train mothers, more communities will have mothers who successfully treat diarrhoea in their own homes.

Immunization

There are six childhood diseases which can be prevented by immunization:

- diphteria
- tetanus
- whooping cough (pertussis)
- tuberculosis
- polio myelitis, and
- measles

Tuberculosis vaccine (BCG) and measles vaccine only need to be given once, preferably at birth and at 9 months of age respectively. DPT and polio need three doses one month apart, starting from 6 weeks of age onwards. In addition, two tetanus toxoid injections for pregnant mothers can prevent tetanus of the newborn.

A high level of coverage of immunization can drastically reduce disease incidence. The best example is probably smallpox; which was eradicated by first immunization and later case isolation. At present, immunization has much attention from the UN, Governments and donors as "Universal Coverage by 1990" is the target. 1988 will be the year of immunization in Africa. In Latin America campaigns have been quite successful and certain countries in Africa are now trying to boost immunization coverage with similar approaches, adapted to the specific constraints of their country. Some governments are, however, opposed to campaigns. Coverage rates in Africa vary from less than 10% to over 60% in Botswana, Mauritius and Seychelles (see Table 2).

Table 2: Immunization Coverage 1985* of Children (0-1) and pregnant mothers

Country	Fully Immunized	Measles	BCG	DPT 111	Polio 111 Toxoid	Tetanus
A						
Seychelles	99	99	99	99	99	100
Mauritius	>60	44	88	83	83	10
Botswana	62	70	83	80	80	24
B						
Zimbabwe	42	53	76	66	61	40
Malawi	35	52	74	58	56	30
Lesotho	49	56	87	54	56	-
Rwanda	<50	66	85	62	56	-
Kenya	<50	55	76	58	57	-
Burundi	<30	37	65	36	29	25
Tanzania	35	40-76	30-76	26-65	26-62	-
Zambia	35	55	82	47	44	38
C						
Swaziland	28	42	72	56	55	Low
Mozambique	<30	46	56	32	32	40
Djibouti	18	17	56	20	20	6
Comoros	15	42	56	31	32	20
Ethiopia	13	16	16	9	9	3
Uganda	>10	22	18	9	8	20
Madagascar	>10	-	13	35	3	-
Somalia	<10	7	10	5	5	-

* Or latest year

Breastfeeding

There is no need for lengthy discussion of the advantages of breastfeeding over any other types of feeding. Perhaps the most important factor is the much lower frequency of infections in children fed with mother's milk. Up-to-date breastfeeding is practised universally in rural areas of Africa and mostly for one and half to two years. However, in urban areas many mothers reduce the period of breastfeeding and favour infant formula or other substitutes. Working mothers have also problems with regular feeding.

It is now clear that unsupplemented breastfeeding for 4 to 6 months is the optimal nutrition for an infant. After 4-6 months, weaning foods will have to be introduced and this is the time where problems start for many African children. Frequent infections, inappropriate weaning foods, and shortage of high-energy foods cause faltering growth after 6 months and continue during the second year of life.

Breastfeeding also has a significant impact on fertility. Prolonged periods of breastfeeding, with or without post-partum sexual abstinence, leads to longer birth intervals and spacing of birth.

Growth Monitoring

Growth monitoring is regular weighing of a child with the results being plotted on a growth card. The trend of the child's growth indicates whether the child is doing well, as growth is a very sensitive indicator of the child's state of health. Growth not only in size but also the growth of the brain is critical during the first years of life and affects child development. A faltering growth as indicated by a horizontal or downward trend of the growth curve should be a sign for both health worker or mother to undertake action.

A child protected by low cost measures, such as GOBI, should have a much better growth curve.

Food Supplements

Food supplements given to high risk group may focus on under-fives under special circumstances or pregnant women. A pregnancy in poverty may lead to much lower weight gain than is desirable and ultimately lead to a low birth weight baby. These babies, defined as less than 2.5 kg, run much higher risks of mortality and their development is probably also affected. The cycle of undernutrition starts with a mother who, as a child, grew poorly in the first three years of life, ended up short, and in turn, gave birth to a higher proportion of low birth weight babies.

Family or Child Spacing

Family planning is perhaps one of the most debated issues in child health. Not because of its impact on health of children and mothers but because of its links with population policies.

Population growth in Africa is presently around 3% annually, and this will lead to an increase of 100% in 24 years. Consequently, child health will be affected by rapid environmental changes. Populations of cities are growing even faster, some 6-7% a year. Many studies have shown that a birth interval of at least two years is favourable for the children's survival chances. In addition, children of very young (under 20) and older mothers have higher mortality risks, just as children in large families.

Appropriate child spacing can have a substantial impact on infant and child mortality. It is estimated that, if all births are spaced at least 2 years, infant mortality will drop by 10% and child mortality by 21%. The effects of child bearing confined to 20-34 years and birth order to a maximum of 4 are much smaller.

Female Education

In every study, the variable that is the strongest correlate of infant and child mortality is education of the

mother. If all women were educated for at least 7 years infant and child mortality would be halved. However, female literacy rates are still low in most African countries (below 50%).

It is thought that educated females provide better child care and nutrition and that they know how to manipulate the modern world. They know where to get help and also recognize illness and go for treatment in time.

Conclusion

The most important health measures are simple and do not require highly trained health workers, such as doctors or nurses. Lower level health workers can perform such tasks much better and more cost-effectively. Primary Health Care workers are even more appropriate as they live in the village and understand and know their community.

The health sector, however, cannot do it alone. Health is affected by many other factors and intersectoral collaboration is a requirement. In particular, the importance and potential of the education-sector in child health does not need any further elaboration.

Health Education for Child Survival and Development

The majority of the estimated 14 million deaths every year of children under the age of 5 years in the developing world is associated with preventable causes, such as diarrhoea, tetanus, measles, mostly pneumonia in conjunction with malnutrition.

As we have seen, relatively simple and low-cost intervention techniques to prevent or cure these common diseases are available. The knowledge on how to reduce the prevalence of these diseases is also available e.g. washing of hands, proper weaning practices and use of latrines.

The gap between what people actually do and what people could or should do for health is large. Education for health, which is one of the eight essential elements of PHC is a very important strategy to reduce this gap.

Approaches in Health Education

During the past few decades, a number of health education models have been developed most of which could be described as "cognitive". These models were based on the view that health education is basically concerned with "telling people" what is good for them, what they should or should not do, how they can achieve the desired result, and what consequences they should expect from certain actions. The underlying concept in this approach was that only a few people knew certain facts and that the majority of the population knew little or held the wrong views.

Once shortcomings of the simple cognitive models were realized, health education focussed on "motivation" as an answer to the reluctance or inability of people to translate the information received into the desired action. Soon, however, it was realized that motivation alone was not sufficient and that there was a need for a much wider approach. As a consequence, a social element was introduced in an attempt to explain the failures of the decision making process and to translate knowledge and attitudes into behaviour.

In recent years, however, a better understanding has developed of the processes that have a positive or negative influence on the harmonious functioning of a person, both as an individual and as a social being. This has prompted study of the role society plays in influencing the individual's health behaviour. It is now recognized that a community's values and norms play a vital role in defining the general approach of people to illness and health as well as to treatment and preventions, and that the process of socialization is one of the most important mechanisms in transmitting certain values and norms from one generation to the next. This has resulted in the development of social intervention models of health education in which the emphasis is placed on influencing social factors, instead of individual factors associated with health and illness.

Health science and technology have come to a point where their contribution to the further improvement of health standards can make a real impact only if the people themselves become full partners in health protection and promotion.

Training programmes should be realistic and preferably start in the field rather than in a classroom setting. Teaching methods call for participation so as to prepare trainees for the approach they are expected to use later with individuals and communities.

Health education in PHC aims to encourage people to:

- 'want' to be healthy
- know how to stay healthy
- do what they can individually and collectively
- maintain health and 'seek' help when needed

CHILD-to-Child Programmes

An outstanding example of education for health with and by children is the International CHILD-to-Child Programme which was started in 1977 by the Institute of Child Health, London, and is now active in more than 40 countries.

CHILD-to-Child is an international programme which teaches and encourages children of school age to concern themselves with the health, welfare and general development of their younger, pre-school brothers and sisters and of other younger children in their community. Children under 5 years spend much of their time in the care of their older brothers and sisters and the older child, therefore, has a strong influence on the development of the younger ones.

CHILD-to-Child helps the older child to understand this responsibility and explains how he/she can contribute easily but constructively to shaping the future life of the little children of the family and the community.

Many of the following suggestions are based on the experiences of this programme.

School Children for Health

School children represent an immense mental and physical potential in education for health.

They can be catalysts of change in the village. They can pass on new health information to their families and lead to behavioural changes.

Information on oral rehydration solution with the correct measurements can be dispersed rapidly by children. Information on specific health activities such as the time and place of a mobile clinic can easily be passed on by children. Children can 'adopt' a newborn baby in the family or community and make a vaccination card to remind the mother when the baby is due to be immunized.

Children are numerous and can carry out joint health actions in the community and make the community a better place to live in.

This may involve community action against breeding places of malaria mosquitoes, sanitary actions (latrines, water source protection), buildings, etc.

The children can care about the health of others, particularly children who live near them, by helping their families to make the best use of available health services.

Care for siblings includes recognition of early signs of illness and knowing what measures will have to be undertaken. Particular danger signs such as rapid, shallow respiration and incipient dehydration can be recognized.

Children can find out about the health care resources in their own community, for example, people with some special health knowledge (TBA, herbalist, health workers).

Children can find out about all the people in their community with some special health knowledge, and then produce a map of the area with all the services available.

Older children can be health helpers: weighing children, plotting on charts, interpreting for mothers, helping to clean the clinic, organizing play groups for younger children at clinic, etc. Simple first-aid can be given at school, toys and games be made for child-minders, food be prepared for younger children at school, young children can be brought to the clinic, health posters can be made, etc.

Children can assist in monitoring and evaluation of health progress and activities in the community. Births and deaths as well as nutritional status can be recorded on a regular basis. Illiterate VANs or TBAs can be assisted by school children.

School children can act as health scouts. These can carry out surveys, e.g. on immunization.

The kind of activities that are promoted in the CHILD-to-Child or similar programmes can include specific elements of the Child Survival and Development Revolution.

The international emphasis on these CSD-elements should lead to greater availability of appropriate teaching materials, methods and resources. These can be used as examples during specific health education lessons or in other lessons, e.g. plotting on growth charts can be linked to mathematics, preparation of oral rehydration fluids to biology or home economics.

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3

BASIC EDUCATION FOR NUTRITION*

According to WHO's definition, health is not the mere absence of diseases but the mental, physical and social well being of the individual. To achieve that state of health, the approach has to be multifaceted and multidisciplinary as the causes of ill health are numerous and complex. The same can be said for nutrition which is an aspect of general health.

Ethiopia harbours almost all kinds of infectious diseases, 75% of which are communicable and can be controlled by simple preventive measures. Among these communicable diseases, venereal diseases, helminthiasis, bacillary and amoebic dysentry, gastroenteritis, leprosy, malaria, tuberculosis and bilharzia represent the top eight as reports from health institutions indicate. However, communicable diseases of high prevalence and of significant importancce are many and vary from one region to another. Measles, poliomyelitis, tetanus, pertussis and inflammatory eye diseases are rampant among the under-five child population. The other major health problem, only second to communicable diseases, is that of nutrition.

Despite the fact that Ethiopia has been referred to as the "bread basket" of Africa and inspite of its great potential in agriculture, due to a multitude of factors closely linked with the political, economic and social systems of the past, it has remained a subsistence producer. Studies undertaken in the past show that in general about 4-10% of the under-five population group suffer from extensive malnutrition. The problem is grave among children aged 1-3 years and it is estimated that 2% of this age group suffer from kwashiorkor, 4% from marasmus, and that 40-60% are under-

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weight. Goitre which is mainly due to iodine deficiency occurs throughout the country and is particularly high in the highland regions. Vitamin C deficiency is believed to have high prevalence in some parts of the country. Despite abundant sunshine, Vitamin D deficiency is known to be highly prevalent in many parts of Ethiopia. Vitamin A deficiency with xerophthalmia also occurs, mostly in conjunction with protein energy malnutrition. Anaemia of the iron deficiency type is common in areas where teff, a cereal with high iron content, is not the staple diet.

In addition to qualitative and quantitative food inadequacies, factors such as harmful cultural practices, lack of knowledge on proper nutrition, poor feeding habits and the highly prevalent infectious diseases contribute greatly to the adverse nutrition situation in the country. Needless to say, these problems need to be tackled from several angles.

One of the main ways of ameliorating these problems will no doubt be through health and nutrition education.

One of the entry points and the primary focus in attempting to disseminate nutrition education must be the school system. This is due to the fact that the young population group is not only the nation of tomorrow but will also act as a bridge in communicating to the parents and the society in general the knowledge and skills that they acquire in school. To be able to accomplish these, a child needs a general formal education experience which involves socialization, development of languages, mental stimulation, physical training, development of positive attitudes and acquisition of knowledge and skills. The one area, however, which needs to be particularly developed is health and nutrition.

A study conducted by the World Bank to review the contribution of primary schooling to development has shown that in addition to increasing productivity, primary schooling has other socio-economic effects, such as reducing the number of births, improving health and nutrition and promoting significant behavioural and attitudinal changes at the level of both the individual and the community. Another study conducted in Ijaji by Hofvander and Eksymer of the Ethiopia Nutrition Institute (ENI) has clearly shown that health and

nutrition education has made a significant impact on the health of children. This does not, however, mean that education of the child population by itself will solve the problem. Thus involvement of parents in the education process will hasten and facilitate the attainment of better health and improved nutritional status.

How much and how is health and nutrition education disseminated in the school system?

In Ethiopia, health and nutrition education is not offered as a separate subject in primary or secondary school. Health is incorporated in many of the subjects taught. Thus attempts have been made to adequately integrate the relevant health concepts into appropriate areas of the teacher training, kindergarten and primary school curricula and into the non-formal education programmes. Health is also an important component of the literacy and post-literacy programmes. The areas which incorporate health include home economics, science, agriculture and physical education and languages to some extent. However, the choice of the right topics, extent of the coverage and the preparation of the teachers to provide adequate coverage of the subject matter seem far less than desired and need to be monitored and evaluated from time to time.

The health and nutrition education coverage of school children does not seem to be uniform for the following reasons:

- home economics is usually favoured by girls and was understood to be a subject for girls until 1975 when boys were made to learn it.

- in comprehensive senior secondary schools, home economics in a wider perspective is taught only to those students who specialize in it.

- in addition to the fact that health topic coverage is less in science than in home economics, the option for students to choose between arts or science subjects, once they reach a certain level in high, school limits the number of students who learn about health.

- the limited knowledge that is given to trainees of teacher training institutes in the area of health and nutrition seriously constrains their teaching effectiveness in this area;

- effective teaching of the subject is further constrained by inadequate teaching materials;

- in addition to the above, in areas where there are health centres, health instruction is given occasionally by health centre staff while in those areas where there are no health centres no health education is given;

- when one looks into the curricula, they are seemingly very comprehensive and applicable to the Ethiopian context. However, the implementation faces problems, some of which are mentioned earlier and others which include the inadequate coordination among agencies working in the field of education, lack of manpower, health contents of existing curricula which need to be updated and enriched, a teaching methodology which should be more practical, innovative, and interesting to the student, and inadequate coverage of health and nutrition concepts in the final primary school examinations.

In attempting to improve the above situation and strengthen the health and nutrition in communities in general and schools in particular, health and nutrition education should be geared to people-oriented technology. Individuals and communities should no longer be fitted into a predetermined framework of health care. Instead, they should be given the opportunity to play an active role in decisions regarding the kind of health technology they receive. This shift calls for a thorough understanding of people's perceptions of their own health and nutritional needs, which may differ from the health care providers' perceptions.

But paying attention to what people view as their needs is not enough; it is necessary to go one step further and promote the active contribution that the lay public can make to health care and nutrition. As has been stated repeatedly, the primary health care approach implies that people should act to improve their own health rather than merely rely on

others doing so for them. To promote such individual and community self-reliance calls for a new technique of social analysis, new methods of education, new approaches to community development and new efforts of advocacy, sensitive to the political, economic and environmental issues involved. In short, it is recommended that in planning and designing health and nutrition education for school children and adults, special consideration of the home and community be made so that teachers, students and the people can play a more active role in the teaching-learning process. In this way, health and nutrition education will become realistic, continuous, and effective.

This perspective on health and nutrition education implies a great many tasks for Ethiopia:

- Health and nutrition education methodology has to be reviewed from time to time and action must be taken to develop teaching methods emphasizing practical aspects.

- Health and nutrition education has to be given as a subject in all teacher training institutes and colleges by qualified instructors. This implies the need for the appropriate manpower development and production of instructional materials.

- The linkages between the Ministry of Education with other ministries and agencies which can contribute towards improving health and nutrition through the school system should be strengthened in the planning and implementation of coherent national strategies.

- Health education has to be enhanced and strengthened in the pre-school education programme, given the importance of developing positive attitudes in children towards health and the need to inculcate appropriate health and nutrition practices during their formative years.

- Wherever and whenever possible, theoretical health and nutrition education has to be accompanied by practical training.

- School gardens which were widespread in the past have to be revived to accelerate the production of vegetables and fruits which will no doubt help in boosting food availability and improved nutrition.

- The school health service has to be strengthened to improve health condition in and around the school, and be used as a practical training ground as well as a source for health concepts.

Furthermore, due to the importance of assessing the impact of nutrition and health education activities on the well-being of children, it is recommended that efforts be made to utilize existing facilities for monitoring and assessment; this may be done by:

- identifying appropriate indicators (change in morbidity and death rates, extent of malnutrition, extent to which recommended health practices are adopted, change in attitudes related to good health, and extent of people's participation, etc.);

- ensuring that health and nutrition aspects are adequately covered in the research and evaluation programmes of the Ministry of Education and in the health information reporting system of the Ministry of Health;

- ensuring that students are adequately examined on health and nutrition in primary school leaving examinations.

4

EDUCATION FOR HEALTH: RESEARCH ISSUES*

> *"You don't know much", said the Duchess; "and that's a fact."* Alice in Wonderland, *Chapter VI - Lewis Carroll.*

When I was asked to address the research issues that concern education and health in Eastern and Southern Africa, I heard the voice of the Duchess as well as my anthropological colleague, Clifford Geertz. He was once asked what the contribution of the social sciences could be to development issues. Before proceeding any further we should keep his answer in mind:

> *The customary reply is to say: the country must modernize if it is to prosper; it can only modernize if certain major social problems are solved; those problems can only be solved if certain sorts of knowledge are available; and social science can provide such knowledge. For my own part, I am dubious. As yet no country has modernized -whatever that term may mean- on the basis of the social sciences and, looking around at what knowledge those sciences have so far produced, I do not see a large prospect of any country doing so. Perhaps a finding here and there will help in avoiding avoidable errors; the habit of thinking abstractly and systematically about social affairs is a useful one for any people and dispassion is a trait in short supply in every political system in the world. But practically, in the narrow sense, rather ends there. The argument for stimulating the social sciences must rest on other grounds than the faith*

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* By Prof. James X. Collins, Head, Health Behaviour and Education, AMREF.

that they will provide ingenious methods for transforming stagnation into movement. It must rest on the far deeper and stronger argument that they are a form of intellectual movement, that they are part of what we mean by modernity. (Geertz, 1974).

In this paper the general context of health care will first be established before specific research issues concerning health and education are discussed. Since there are so many research issues to be considered, this paper will only concentrate on three: the research environment, urban health and women's health. The major problems that affect the health of the people of Africa in 1985 are not issues of specific diseases but rather are issues of ecological deterioration, socio-economic gaps between the rich and the poor and the rapid population increase in Sub-Saharan Africa. As Dr. Bernard Perey, in the Annals of the Royal College of Physicians and Surgeons of Canada, said in 1982:

> *The greatest remaining opportunities for further prolonging life and for generally improving health are essentially beyond the grasp of medicine, whether preventive or curative, and it is so because these opportunities reside in the changes in life styles (smoking, driving, anxiety, drugs, exercise) or in changes in social conditions (education, eating habits, income) or in changes in the physical environment (air, water, working conditions, housing and safety).*

While this may be true for the so called developed world, it is hardly true in sub-Saharan Africa. If only $5 are available per person for health in Africa then serious decisions must be taken about how this money should be spent. A first step for researchers should be to examine the priorities that must be established if the goal of the World Health Organization of 'Health for All by the Year 2000' is to be met. The kind of health care system that should be established and the role that education for health should play are political and economic issues. The attitude of

the governments in various countries towards research in issues of equity, priorities, and distribution of resources will seriously influence the role of the researchers.

It is a truism that societies differ in their ability to generate, conduct, and apply research and in their inclination to do so. These differences in research capacity stem from characteristics of the research environment, including such things as the quality and range of available research skills, the strength and cohesiveness of research institutions, the level of public demand for research, and the general supportiveness of the research climate. (Court, 1983).

The research community that is interested in questions of education and health in Africa are found in the universities, government ministries and non-governmental organizations, among whom are many religious organizations. It is primarily the government ministries -of education and health- and the non-governmental organizations who are interested in the results of such research. The magnitude of government demand, however, should not be exaggerated. In relation to the volume of money devoted to the education and the health system, the proportion allocated to research is miniscule. The task of simply maintaining a massive and expanding system leaves little time for research programmes, and a belief in the usefulness of research has not reached the level of institutional conviction to incorporate research and evaluation units and to staff them effectively in all the appropriate ministries. It should also be admitted that the cases where research findings have been the explicit basis for new practices are not overwhelming. Government's attitude toward research is often characterized by ambiguity. On the one hand, research and ideas are sought for their planning utility, and on the other hand, tolerance of the governments for opinions that imply criticism is limited. It is important that while the expansion of research in the areas of education and health is a reality in post-colonial Africa, there are a series of continuing constraints. Among them is the difficulty of recruiting the best talent into research and writing. Another problem is the shortage of local funds for research and the shortage of foreign exchange which restricts the exchange of journals with overseas

universities, professional travel and a variety of activities or services that are simply taken for granted by researchers in more wealthy contexts. Since local resources are limited, external sources tend to dominate the pattern of research funding. What is needed is to strengthen the research environment in Africa. In brief some of the issues that will have to be addressed are:

1. Develop a consumer constituency for the contribution of research to health and education programmes.

2. Improve the role of the social sciences in research concerning health and education.

3. Provide incentives to quality research and publications for education and health.

4. Promote regional and continental interchange of research findings.

5. Develop operational research programmes to monitor and evaluate programmes in education and health. Operational research units must be committed to the dissemination of their findings.

6. Expand the number of researchers working in the areas of education and health.

Whatever initiatives dominate the future development of research in the areas of education and health, it is clear that they will be dominated by the political, economic, and administrative environment in which they are launched.

The remainder of the paper looks at some research findings in urban health and female health and then proceeds to make a series of recommendations for research.

Research on Health and Disease in Poor Urban Communities

Studies which have examined the health of the urban poor may be categorized into those which:

- examine health only in the shanty or slum and make no comparisons with other areas;
- compare the health of the urban elite with that of the urban poor (i.e. intra-urban differences);
- make rural-urban comparisons.

There is a variety of studies in each category covering a range of cities and countries. The present report examines each category in turn.

Studies of Slums and Shanty Towns

Notable among studies which focus upon the slum or shanty alone and give an overall picture of conditions and health problems, are the surveys by Kothari et al (1983) in Bombay, the Morrells (1981) in Manila, Tecke and Shorter (1984) in Amman, and Barton (1976) in Lima. Other studies focus upon certain aspects of health. For example, Datta Banik (1978) demonstrates the high rates of helminthic and parasitic infections in pre-school children in a slum area of Delhi while Sabir (1984) found that 73% of the children in 151 households of a Lahore slum were malnourished and 61% were growth stunted.

Intra-Urban Differentials in Health

The study of intra-urban differentials is in its infancy, so that people seldom realize that there are urban groups whose health conditions are in several ways worse than those of corresponding rural groups. Seldom do there exist in the rural areas the appalling conditions of extreme misery, destitution, environmental degradation and moral disruption that affect huge populations in many large and intermediate

cities of the developing world. Without wasting resources or burdening the system with unnecessary data, an effort must be made to delineate 'high risk' areas and population groups, and to provide minimum, purposeful, properly disaggregated information, that is sufficient to identify and illuminate the problems and to monitor change. As Rossi-Espagnet (1984) has stated "A systematic study of intra-urban differentials in health and health-related conditions has not been carried out anywhere in the developing world" (p. 14).

One aspect which is rarely considered in the literature is the difference between poor urban communities within a city. The exceptions are Bapat and Crook (forthcoming) who examine the environment, health and nutrition in different types of settlements in Poona, and Schensul (1985) who is developing a typology of poor urban communities based on 'urban services' and 'social organizations'. Preliminary results from Lima indicate that diarrhoea and respiratory problems may be associated with the 'less developed' communities (i.e. those with less urban services and less social organization) while malnutrition may be associated with the more developed communities. It is suggested that the more developed stage calls for much more cash outlay in building permanent housing and contributing to cooperative water, sewage and electrification projects. Scarce cash which goes to these essential resources may mean less food for children in the family (Schensul, 1985).

Comparisons of Urban and Rural Populations

Studies which address comparisons between health of urban poor and rural populations have usually found that there were more severely malnourished children in low income urban than in rural populations (Monckeberge 1968, Khanjanasthiti and Wray 1974, Prasada Rao et al 1974, Karejan 1981, Sudharto 1983, Brink et al 1983, Arias 1977). Nelson and Mandl (1978) have analyzed the reasons for this. Although in South East Asia and Latin America rural labourers largely depend on their landlords for their food, many rural families, especially in Africa, own a small piece of land where they can grow part of their food, or where harvest surpluses are

available: this is generally not possible for the poor in the overcrowded cities. In the cities, although salaries are higher, so also are costs, with the result that the poor have a smaller proportion of their income available for food. Furthermore, in the highly competitive situations of the city, women are often forced to work in full or part-time jobs (generally in the informal sector) to complement the family income or as the only family support. Under such circumstances, women may typically have less time for food preparation and they may resort to early weaning, may leave their infants in the custody of young children unable to prepare weaning food properly, may have to dilute and divide a limited milk supply among many and may fall easy prey to advertisements for breast milk substitutes (Plank and Milanese 1973).

Women's Health

In the household and in the community, women are the informal providers of health care. Because of their child bearing function, they also have special requirements for adequate diet and health protection. There is growing recognition that their own health and their role in promoting health care are the keys to health for everyone. Yet the general information that is available indicates that in much of the world they are more likely than men to be malnourished, poor, and illiterate, to carry a heavier workload, and to have less access to medical facilities. The adverse effects on their own health extend to their off-spring as well.

Life Expectancy

What we know in global terms about women's physical well-being comes primarily through records of mortality. The widely used indicator is life expectancy, which is based on age-specific mortality data. This provides the only consistent basis at present for judging changes in women's general health over time and differences among countries. While it tells us nothing specific about the quality of health during life, it does convey one encouraging message: in

1985, the average female at birth will have 13 more years of life than the female baby born in 1950. The bad news is that there continue to be very large variations below the average, and female babies in poorer countries still have a shorter life ahead than those in richer countries did 35 years ago.

Factors Affecting Women's Health

The very broad differences among women in life expectancy naturally raise questions about factors affecting health that are specific to women. For at least partial answers we will have to look primarily at two subjects on which a certain amount of practical evidence is available. Malnutrition is frequently described as the major health problem affecting women in the Third World. FAO has estimated that one-quarter of the population in developing countries is undernourished, but precisely how many of these are women is not known. Yet there is ample evidence both in social customs and in surveys that malnutrition occurs disproportionately among girls and women. Food taboos are more commonly imposed on women. Furthermore, in many societies it is customary for the men to eat first, boys next, girls and women last. If protein is scarce, it goes primarily to the men.

Repeated child bearing, short birth intervals, and pregnancy at an early age, all pose high risks to the health of women. World fertility is decreasing, but on average 3.8 children are born to women in developing countries (compared with 2.0 in developed) and national averages still go as high as 8.1 children. It is estimated that at any one time one woman in six in the ages 15-49 is pregnant in developing countries (excluding China), compared with one woman in seventeen in developed countries.

Proportionately fewer pregnancies result in surviving infants in the poorer countries. Infant mortality runs as high as 20 percent -one birth in five- in some national averages, particularly in Sub-Saharan Africa. An Indian study found that a woman in that country with six surviving children over one year of age has typically been pregnant

eight times over the 30 year span of her reproductive life. Since each liveborn infant is generally breastfed up to 2-3 years, she will have spent 200 months, or 50 to 60 per cent of her reproductive years, in pregnancy and lactation.

Every pregnancy is a drain on women's health reserves. One study estimates that about 100,000 calories are expended per pregnancy, about 1,800 calories per day during lactation. Although nutrient requirements rise, among impoverished people the diet often cannot change to compensate. Malnutrition drives up material mortality and overall death rates in women's fundamentally strong mid-life years.

The availability of family planning programmes is one factor which can make an appreciable difference in the survival rates of women and infants. Family planning makes it possible for women to avoid high-risk pregnancies and the illegal abortions which are a major cause of death among women in developing countries. Tens of thousands of women in the Third World die every year from complications of illegal abortions.

Recommendations for Research

1. Operational research be carried out of ongoing programmes e.g., health education, nutrition, control of infant diarrhoeal diseases, leprosy, expanded programme on immunization, etc. to determine what actual experiences show to be effective (and ineffective) techniques in the region and in other parts of the world.

2. Experimental research be carried out on similar problems in which alternative approaches to the same problem are tried under controlled conditions, with careful monitoring and evaluation of results from the inception to the conclusion of the experiment.

3. Research be carried out to determine how community participation can be most effectively achieved in primary health care programmes.

4. Research be carried out on the means of effectively involving indigenous medical practitioners in primary health care programmes, such study to include evaluation of the efficacy of traditional therapies as well as cost/benefit analyses.*

5. Research on the problems of delivering health care in rural and urban areas, including such things as:

   a) Frequent lack of coordination among different agencies and departments;

   b) Frequent inability of communities to express their "felt needs" (i.e., health priorities), and

   c) Physicians' attitudes about primary health care in so far as their own careers are involved.

6. Studies to be made of the role of voluntary organizations and of health volunteers as adjuncts in primary health care programmes.

7. Research be undertaken to determine the efficacy and cost/benefit implications of incorporating traditional healers into primary health care programmes.

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* A major oversight in social science health research has been failure to pay detailed attention to indigenous concepts of disease casuality (which provide the rationale for therapies), which, if understood, explains the choices patients make in seeking health care, and make possible a rational design of health education messages that are congruent to the thinking of the people toward whom programmes are directed. With respect to the provision of health services, until recently, the problem had been seen as how to replace traditional medical practices with western medicine. Today, the problem has been redefined as how to combine and integrate the best aspects of traditional and modern systems in a unified approach to achieve the most effective and comprehensive possible health care. Knowledge of the processes of behavioural change is essential to realization of this goal.

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5

WISE USE OF NATURE - HEALTH AND ENVIRONMENT*

Introduction

There have been very many assessments of the problems of Africa from many sources, from individuals to large commissions. The more penetrating of these always stress the need for better education if there is to be any long-term solution. The statistics on education, health and environment in Africa are at the same time optimistic and depressing. For example, in the last twenty-five years, school enrolments have grown very fast, from 36 to 63% of the age group at the primary level, from 3 to 13% at the secondary level, and from almost zero to 1% at the university level. This is in spite of basic constraints that still persist. Elementary school enrolment amounts to only two thirds of the applicable age group. In about one third of the countries, less than half of the primary age group is in school. In only six countries is more than 20% of the relevant age group in secondary school.

These same twenty-five years have seen similar ironies in health care. A 21% increase in life expectancy has occurred, rising from 39 to 47 years. Child deaths fell from 38 to 25 per thousand, and the number of medical personnel per capita has doubled, despite rates of population growth that are among the highest in the world. On the other hand, life expectancy in Africa is still 27 years shorter than in industrialized countries, and less than in any other developing region. The probability that a one-year-old child will die before its fifth birthday is 25 times greater than in the Western World. The population continues to be exposed to endemic disease (especially malaria) and to disease caused

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* By Dr. Jim Connor, Adviser to New York Zoological Society, Environmental education Project.

by poor sanitation, malnutrition and poverty (respiratory infections, intestinal parasites and gastrointestinal illnesses).

Environmental education has progressed a great deal in many African countries, especially where government leaders have espoused national tree planting and reforestation programmes and set aside large tracts of land for wildlife preservation, not only for the economical benefits of tourism, but for national pride as well. Yet the continent continues to be devastated by deforestation, drought and famine. And these tragedies escalate the flood of refugees, further upsetting fragile economies and encouraging political upheaval.

For all of the above, education plays an important role, direct or indirect. In its attempt to emulate the industrialized world, science/technology education has been focussed on as a chief means. And for those who know the continent more intimately, health and environment education are seen as the most important general areas to emphasize. Pragmatism is, however, needed in both areas, extending what Unesco's Tbilissi Conference outlined as the main characteristics for environmental education:

- a problem-solving approach
- an interdisciplinary educational approach
- the integration of education into the community
- a life-long, forward-looking education

General Approach

"Wise Use of Nature - Health and Environment"; this title presupposes many things.

Wise - to aim at ongoing, long-term production; to balance development with conservation for individual and national good.

Use - not passive but active; to control nature.

Nature - everything, in and around us from atom to stars, beneath and beyond, including all of us with no exception, living together on spaceship Earth.

Health - balanced production; life-sustaining and enriching for body and spirit.

Environment - all that is, but emphasizing the material and energy resources for basic needs of food (nutrition), clothing, shelter, transportation, communication, etc.

The themes of health and environment are appropriately stressed because they have become symbolic of the differences between the developed and developing world. It is the advance in nutritional science and sanitation that has started the chain beginning with the drop in infant mortality and the consequent rise in population. The chain continues with the demand for more food production and farmland, ending with fewer forests, more soil erosion and desertification. Advances in biology and agronomy have solved this for some countries while others have yet to benefit fully. And while the environment has always been called on to supply energy to individuals through food and fuel wood, today new demands are made to furnish heat, light and electricity through the coal, oil, water and even nuclear power of the industrialized world.

Let us then boldly attempt to look at the whole picture in schematic fashion and analyze the parts that extend from the resources and needs of Africa to the means for solutions and the problems that are bound to occur. Then let us consider what can be done from the educational perspective, both formally and informally at every level.

Resources

The resources will differ greatly for each country but at a simplistic level can be considered as the Animal, Vegetable and Mineral components of Land, Water, and Air. Men and women are considered here as resources to better focus on how much one person's resources can help another's needs, whether physical, social, spiritual, etc.

Needs

The needs of people in arid lands do differ in many particulars from those of people living in savannas or jungles. But the general needs for food and drink, clothing and shelter, communication and transportation, etc. are universal. And these needs of people in their environments can be usefully grouped into needs for health and for energy from their environment. The first emphasizes the nutrition and sanitation concerns that allow people to live active and disease-free lives for the short-term while the latter focusses on the longer term needs of individuals, families and whole societies in their move towards a more technologically based future. The term environment will be used instead of energy here since it emphasizes the balance between development and conservation that must be sought.

Means

The means for bringing the resources of the country to meet the needs of the people will probably come through the sectors of applied science/technology such as agriculture, industry, medicine, etc. There have been great advances in each of these areas with new methods of farming, new crops, machines, new drugs, etc., all helping to improve the health and environment of the nation's people.

Problems

Yet the very advances for improving living conditions in any one country have often been the source of large problems. New medicines and vaccines have allowed many more infants to survive and adults to live longer. But this increase in population has put great pressure on the farmers to produce enough food and the drivers to transport it. The pressure on farmers and families has also led the extension of farmlands into traditional forest preserves. To satisfy the energy needs for cooking fuel and the need for more building poles for larger families, more trees are being cut down than ever before. And while the developing world does not yet have the same level of pollution problems as do the more industrialized societies, already factory emission and pesticide runoffs are taking greater tolls.

Educational Approach

Now let us attempt to look at the educational solutions in the same way that we have faced the science/technology - health/environment issues. Once the needs, resources, means, problems and solutions have been understood; it is important to then decide on how best to educate children (and adults). It is not enough to decree what "should" be done and hope that it will be. If the advice is successful, this is usually by accident. Echoing Tbilissi's earlier advice, let us see how we can be interdisciplinary, integrative and problem-solving for a life-long education.

A great mistake in very many countries, both developed and developing, has been to consider the "three R's" reading, 'riting, and 'rithmetic, as three separate disciplines. Since they are so important and basic, it is not always obvious that they are really tools, i.e. to read, write and count something. They are often treated as ends in themselves. This can easily lead to boring and self-defeating lessons. On the other hand, lessons that combine the interest and fascination of many science experiments with students reading and writing about them can help both areas at the same time. This serves to make learning the pleasant and challenging experience it should be.

Another level of interdisciplinary integration is a by product of the scientific-technology "fix" of the modern developed world. Since science and technology are everywhere, it is relatively easy to connect this all-pervasiveness to the goals and promises, benefits and problems of the modern world. Thus all parts of social studies can come into play, history, politics, economics, geography, etc. Ethical and religious issues also abound and will certainly have very different answers, depending on the religions and cultures of the nation where the questions are asked. Art and music, while usually treated in themselves, can reach new dimensions when related to topics like health and environment that are of interest and importance to children. They can find an easy expression in their posters and poems, songs and plays, bringing new life to classroom and home.

It is important to note, however, that the above statements are not to lead to an overemphasis on science and technology seen through the themes of health and

environment. There are many other things to read and write about, draw and sing about, other reasons to learn mathematics, other social issues, ethical and religious questions to consider that do not involve science/technology. The point is to join when feasible the "3R tools" with topics that have proved not only motivating for students but are essential for those developing countries who want to enter the world of technology.

While a thorough integration from pre-school to university might be desired, it may well be impossible, certainly over the short-term. And since the external examination for secondary schools and the professional demands for universities still are so influential, it is more efficient to work with the primary schools. Here the teachers and the curriculum are usually both more flexible so that the topics can be rearranged more easily. As newer ideas are accepted in the lower levels, a pressure for change at the higher levels will build up quite naturally, especially with the few years from the graduation of qualified primary students until they return as teachers themselves. This can be quite effective if at the same time there is communication about these ideas among the administrators, professors and teachers at the secondary and university levels.

Teacher training is too often an expensive, difficult, drawn out and ultimately ineffective process. The problem is a very complicated one and often beyond the means of the expected trainers, the teacher training colleges and their pre- and in-service courses. With the colonial heritage of top-down change and a teaching tradition of authoritarian lecture, it is difficult to change to a student-centered, teacher-inspired approach to problem solving, and discovery science.

While it is important for Ministries of Education to decide on and foster appropriate curriculum, methodology and policy matters for the nation, this is not enough. An effective strategy would engage the teachers from the start in this planned change and provide informal materials with which the change can begin.

Conclusion

But what is to be actually taught? What is to be the curriculum? If a nation's goals are to advance toward those of today's developed world, then certainly the best and most recent advances in science need be featured. Yet there must be a focus on the background and the level that will make the science understandable for the children in their own context. The emphasis must be on a rethinking, then possibly on a reordering and repackaging of the traditional topics that will make more sense to today's children. Thus traditional biology becomes applied biology for topics on nutrition, sanitation and agriculture. Chemistry also enters in topics on nutrition, fertilizers and pesticides while the physics that is usually divided into mechanics, heat, light, electricity and nuclear energy is reinterpreted to emphasize the application for local and national energy and power needs under those same headings.

As examples of how science/technology/society issues are faced in the developed world, in Great Britain the Association for Science Education has advocated not only the study of pure science but a "Science for Action" and a "Science for Citizens" in their secondary level science education programmes. From this "Science in Society" programme has been generated much material and the 16 titles of student readers are instructive.

A. Diseases and the Doctor
B. Population and Health
C. Medicine and Care
D. Food
E. Agriculture
F. Energy
G. Mineral Resources
H. Industry: Men, Money and Management
I. Industry: Organisation and and Obligation
J. Nature and Science
K. Science and Social Development
L. Looking to the Future
M. Engineering I
N. Engineering II
O. Engineering III
P. Nuclear and Defence Issues

In the United States a major report from the National Science Board Conference on "Goals for Science and technology Education Grades K-12" (April 1983) advised that "science curriculum grades 9-11 be 'structured around the interactions of science and technology with the whole society', with instruction centered around problems that 'integrate knowledge from engineering, physics, biology, earth science, and applied mathematics'."

Also recommended were the "integration of science, technology, and applied mathematics throughout basic education" and "curriculum organized around problem-solving skills, real life issues, and personal and community decision-making."

What has been set out in this brief paper is more schematic than usual. If expanded, a volume or two might be filled. The real focus is on the total picture and what needs to be done for both short- and long-term. Without this holistic approach to individual and national needs, to both the formal and informal curricula, to all disciplines within the curriculum, to teacher training and supervision, to various methodologies -places may be forgotten or ignored which would disrupt and make ineffective the whole.

This paper hesitates to go farther. What is called for now is a boldness to meet these challenges. Many questions need to be asked and answers attempted about:

Curriculum	- for life-long learning - appropriate topics and sequence - interdisciplinary and integrative
Materials	- formal and informal - inexpensive labs and texts
Methods	- "3R's" as tools for health/environment - "hands on" experiences
Teachers	- pre- and in-service training - part of the planning at all stages

6

AN ENVIRONMENTAL SPECIAL MAGAZINE*

One of the most exciting and innovative education projects to be developed and implemented in Kenya is known as the Pied Crow's Environment Special Magazine. Developed in response to the ever-increasing need for children to have access to materials on environment and health topics, the Environment Special Magazine is produced in support of Kenya's Ministry of Education, Science, and Technology. An environmental education syllabus/source book produced by the Kenya Institute of Education and the Natural Sciences Curriculum for Standard VI, VII, and VIII is the foundation upon which the content and continued development of the Magazine is based.

Introduction and Background

What is the Pied Crow? To upper primary school pupils it is more than a black and white bird found throughout Kenya. Every other month, six times a year, twice every school term, Pied Crow introduces new materials relevant to environmental and health issues in Kenya and East Africa. Each sixteen page issue contains eight colour and eight black and white pages with information ranging from basic concepts and aspects of the "environment" to practical activities such as tree planting, soil conservation, and energy saving hints. Other ESM issues reintroduce these basic themes and topics, and relate them directly to people and population growth. Materials are designed to complement the natural sciences syllabi in Standards VI, VII, and VIII of the Kenya Primary School Curriculum. The Magazine's contents are in English,

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* By Peter Hetz, Project Manager, CARE-Kenya.

with two pages in each Magazine devoted to teachers -recommending additional activities with pupils inside and outside the classroom. All materials are read and approved for distribution by the Inspectorate of Primary Education, Ministry of Education, Science, and Technology.

At present some 12,400 Kenyan primary schools receive four copies of each publication of the Magazine. It is estimated that the target audience in upper primary school Standards VI, VII, and VIII is some two and a half million students and their teachers. In addition, the magazine is circulated to District Education Officers and Teacher Training Colleges throughout the Republic.

Funding for the Environment Special Magazine Project is provided by CARE-Kenya as part of its assistance to primary schools. This represents a significant contribution to information dissemination and assistance to primary schools.

Goals and Objectives

The goals of the ESM project are three-fold:

- Short-term (one to six years) -- to increase the awareness of environment and health issues of Kenya's Upper Primary Standards by producing, publishing, and distributing the Environment Special Magazine. The magazine will be written for pupils with supplementary materials for teachers. Efforts will be made to seek additional funding to increase the number of copies sent to each primary school.

- Intermediate (three to five years) -- to involve teachers, the Inspectorate of Primary Education and other relevant institutions in the production, evaluation, and use of the magazine. The development of mechanisms for contribution and feedback would not only serve to improve the content of the magazine, but would provide the basis for development of teachers' activity/theme kits on environment and health topics for use in the classroom and teacher-training institutions.

- Long-term (more than five years) -- to bring relevant environmental and health topics and themes into the formal curriculum and textbooks of Kenya's primary schools and teacher training institutions.

To meet the goals of the ESM Project, project staff, CARE-Kenya, the Ministry of Education, Science, and Technology, and the National Museums of Kenya, have joined together to address the recommendations of an independent evaluation funded by the Ford Foundation in 1984/85. The four groups are working in concert not only to continue and coordinate the development of materials through an editorial board, but to develop further mechanisms for follow-up and feedback on the Magazine's materials and uses in the field.

Themes and Topics

The ESM Project has been operating successfully since July 1983. The following themes have been or will be addressed in the Environment Special Magazine.

1. Our World, Our Environment
2. Air and Water
3. Soil
4. Let's Start a Tree Nursery
5. Planting Out
6. Energy
7. Bees: A Natural Resource
8. Road Safety
9. Wetlands
10. Where Are We Growing? Population
11. Population and Water
12. People and Land
13. Forests for Us
14. People, Population, and Energy
15. People, Cities, Towns, and Employment
16. Population and the Family (Home Economics)

Distribution and Costs

At present, 60,000 copies of the Environment Special Magazine are produced and printed with the resources available in Kenya. Local graphic and written contributions are solicited and used under the supervision of the production staff and editorial board. 50,000 magazines are distributed to schools, District Education Offices, and Teacher Training Colleges. The additional copies of the magazine are used to support intensive distribution in National Museums of Kenya Regional Extension Education projects and CARE-Kenya field projects. On occasion, the Magazine has been used to complement the field activities of agricultural extension and family planning field workers. All magazines are either distributed using the Kenyan national postal system, or by appropriate field personnel in the case of intensive schools' coverage.

The costs for 60,000 magazines including the design, production, printing, packing, and postage is approximately 10,500 US dollars, or 17.5 US cents per copy.

Evaluation and Future Plans

The evaluation of the Environment Special Magazine was completed successfully, and the results were extremely encouraging. Not only were the majority of schools receiving the materials, but the materials and activities were contributing to the natural sciences programme. Additional benefits of the Magazine included its use in English comprehension and composition, development of school libraries, use in maths classes and library periods. Many teacher simply expressed their enthusiasm for appropriate materials reaching the schools where texts and reading materials are in such short supply.

The Environment Special Magazine is intended to serve as part of a larger information network for environment and health materials directed at children, newly literate adults, and rural development programmes through local vehicles such as newspapers, magazines, radio, and television stations.

The ESM already served as a model for replication in Indonesia, and is proposed for Belize and the Honduras in Central America. A French version has been proposed for Francophone countries. Funding has been pledged by CARE-Uganda for distribution of the ESM to Ugandan Primary Schools.

Conclusion

Clearly, the Environmental Special Magazine has demonstrated the potential of one approach in providing important environmental and health information to formal education audiences on a regular basis. In addition, the Magazine represents one significant way in which long term donor commitment can be married to national governments' development and education needs. Additional follow-up, support, and funding is needed to achieve the Project's intermediate and long-term goals, but the continuing success of the ESM is helping to meet some of Kenya's communication and education needs.

The Project is an exciting, colourful, and informative approach to information dissemination and environmental education within the formal sector. It is assisting Kenya in addressing a mass audience with basic information on natural resources, their importance and conservation, and personal and public health. Such efforts, it is believed, could be replicated elsewhere with equally positive effect - contributing to the development of an informed and literate public.

7

CHILDREN AS AGENTS OF CHANGE - WATER AND SANITATION*

It has taken some time for the world to realize that development is more than a pure economic process. Development is not an automatic process that is the result of the injection of capital and technology, but it is ultimately the changes that take place in man. It is an educational process that aims at changing the behaviour, the priorities and choices by the people. In Africa, the water supply programmes of the sixties and the seventies are a clear case in point. It is by now estimated that over half the pumps and public taps were out of order within a few years after being installed. Water is not a controversial development item, and the terrible performance rate of the water supply programme is not so much due to financial or technical bottlenecks, but to a lack of community participation. Sanitation, which is a much more complicated development item, shows the same poor performance rate. On a global basis it is believed that over 40% of the latrines are not used. The facilities are there, but the communications necessary to cause a real change have not been successful in achieving sustained participation of the people.

Education is a central factor in the change in behaviour that controls development and community participation, but the education process needs to persuade people that the new ways are to their advantage. Adults are equipped with a balanced pattern of beliefs and habits that guides them through life. The development process is changing and often disrupting this cultural pattern and that is a reason why development efforts often meet so much resistance. Only if a link can be made, that gives the people a clear motivation, change will be achieved. In some areas of development such changes

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are especially difficult to achieve, because the traditional rules are strong and rigid and when strong pressure is exerted the people will pretend to go along, but in reality resist change. In Human Settlement Planning and in Health many such situations have thwarted the efforts of governments to promote a rapid development. The settlement of nomadic people, the introduction of sanitation and immunisation campaigns have all, time and again, encountered profound resistance in the first attempts to reach the whole target group.

In all cases it was found that radical changes in the beliefs and habits of people that these programmes brought along, needed much time and communications before being successful. The time perspective for national programmes is not years, but decades, in view of the numbers, distances and logistics involved. Consequently most of the people who are to be affected by these programmes are not yet adults and do not have to be shaken of a rigid set of beliefs, if they can be reached now about some of the development options that they can choose later. Communications with children are increasingly recognized as a crucial element in development planning, because children have great development expectations and are open to new ways of doing things. When reached before they have fixed ideas about behaviour they will accept future changes without the emotional trauma that certain developments will cause adults.

It is in this context that a programme of child communications has been considered by UNCHS/Habitat and UNICEF concerning environmental health and human settlement development. The children of Africa are the future targets in the development programmes in this field and educational efforts promoting better human settlement and environmental conditions now will facilitate the implementation and acceptance of such development programmes in the future. As the subject of the first efforts of the two agencies, the introduction of sanitation has been chosen. In this field the cultural factors are particularly strong because sanitation is surrounded by many taboos and much secrecy. Communications in this field have in Africa more often failed than in any other area. Sanitation as such is not a very fashionable area and people either avoid the subject all together or shroud it in euphemisms that complicate practical activities. The common expressions of "going private",

"washing hands", "going to the bathroom, rest room, comfort room" are part of the elaborate efforts we all engage in to avoid any reference to defection and urination, the simple body functions we are really talking about. Even the professionals in this field have developed a whole language that attempts to sanitise their very field of activity.

Low cost sanitation is a relatively new approach that recognises the simple truth that sewerage systems - by most people seen as the ultimate sign of civilisation - cannot possibly be made available to the low income groups in the developing countries. At the same time it was recognized that without sanitation, clean water will remain much of an illusion. While sanitation for a few privileged does not mean very much, basic sanitation for all the members of a community breaks the major link of contamination that in the developing countries takes at least ten years off everybody's life. The development workers in this field are all too familiar with these facts and for them sanitation facilities are long overdue services that need no elaboration. The focus of the project workers becomes, therefore, a short one and as a result the construction aspects of the latrine programmes dominate their perspective. But the low rate of effective use of these facilities demonstrates that the construction programme is not the main question for the recipients. For them the question concerns a change in behaviour that is difficult to achieve and sometimes difficult to justify. Little of what the project workers tell them has any relation to their ways of seeing the world and unless an appeal is made to motivations they can identify with, the people are unlikely to change their ways.

From the side of the national and international agencies active in the field very little has been done to identify motivational factors that may be utilised to achieve a better participation by the people. The main emphasis has been health education, simply because that is the main motivation from the national point of view. But whether this makes any sense from the individual point of view, remains a question. Experiences from other fields do not suggest that health is effective as a sales argument to change human behaviour. Driving after drinking alcohol is an invitation for accidents as we all know, but few of us take a taxi home

after a party. We just drive home and press our luck a little. On a national scale we only have to look at the traffic statistics to see that this is taking a lot of lives. And even on a more personal and direct level, we all know that smoking may kill us through cancer, heart attacks and other long-term effects. But we are all sure that this is true for our neighbours only and not for ourselves. Giving up smoking is often more related to group pressure -the rejection of our behaviour by our friends - than to our concern about our own health. The same is true for changing sanitation behaviour, even more so since it is such a private and secretive part of our lives. In some cultures this is so explicit that it is even not supposed to exist, and consequently it cannot be discussed. In several areas in East Africa adult men are believed to live without defection. An old man found defecting would lose his status and respect for proving to be as mortal and simple as women and children. The introduction of a latrine programme in such areas will obviously encounter fierce resistance. The construction of a latrine will not achieve much in such situations and the lack of awareness of motivational factors is defeating much of the good intentions of the sanitation programmes.

It is in response to the understanding that without motivation, efforts to instil knowledge are bound to fail, and that without effective communication aimed at motivations, little community participation is possible, that UNICEF and UNCHS have started to study implementation strategies that will result in a better acceptability and participation in this field. The changes in behaviour in the field of sanitation are probably more difficult to achieve than in other areas of human settlement development. Experiences have amply demonstrated that communications in this area are very difficult and often result in misinformation that adds to the difficulties in the projects. The latest survey of the Botswana sanitation programme showed that over 90% of the rural owners of ventilated pit latrines reported to wash their hands after each toilet visit, in spite of the fact that few have access to water anywhere near their latrine. They gave the answer that made the interviewer happy and did not tell the truth. Interviewing adults about sanitation is by and large a futile undertaking, because the surveyors are usually seen as the representatives of the authorities and interviews are therefore seen as inspections or tests of knowledge and not as neutral instruments of information.

Communicating with school children has shown to be much more effective. If given in a proper educational context children may giggle about the subject, but are likely to take the exercise seriously. They will see it as a learning exercise, discovering how things are and how things can be. If they perceive their own role as active participants in a joint learning and development process, they will not only make efforts to learn, discover and report, but they will not remain unaffected in this exercise. It will open them to participation in new and better ways of living.

Lessons from Machakos

In the past few months an experiental programme was executed in Machakos district in Kenya, where UNICEF included a demonstration sanitation programmes in the schools in the framework of emergency relief in this famine-prone area. In each of the schools rain water was collected in tanks and VIP latrines had been installed. The sanitation communication programme came as a follow-up of the construction work. The schools received background information of latrine use and maintenance, which was distributed to the children and which was used by the teachers for some lessons on sanitation. The next step was a children's competition consisting of a general questionnaire of behaviour and existing conditions, and a survey by the children about traditional beliefs and habits. The children were asked to talk to their grandparents about taboos, rules, beliefs and practices in the field of sanitation and report the results in drawings and essays.

The participation of the schools was very encouraging and there were many indications that children in their teens are much more reliable informants than any adult group that has been used earlier, including teachers, health workers, politicians and local leaders. The exercise showed the child channel effective in three distinct ways:

- The excitement of a school competition resulted in a strong educational effect: much new knowledge was digested and this is likely to make them in the future

more open to change. In other words the new knowledge will help to prevent traditional beliefs to gain an inflexible hold over the future behaviour of the individual and will help to promote change when that is introduced.

- The children do not have to overcome the suspicion and fear that so often distorts the exchange of information between projects and participants, because there exists a relationship of trust and intimacy between them and their grandparents who are interviewed by them. Children are therefore quite reliable sources of information, provided that they are guided and motivated properly.

- It was also found that the excitement of the children about the competition, the prizes, the role of being information agents and carriers of new information spilled over the community at large. Their questions, the information leaflets they carried, the discussions they had with relatives, the drawings they made could not be avoided by the other members of the family. They could disregard it as unimportant, but could not avoid to be exposed to it. The competition served, therefore, also as a mobilising device, conditioning the community for the later adult communications as a part of the expected sanitation campaign.

The three factors: education of the future adults, more reliable information about existing conditions and the mobilisation effects on the community help the long process of change which development is. In a very sensitive field as sanitation it offers one of the few viable methods to achieve a realistic picture of the motivational factors that may promote or hamper such programmes: understanding the mechanisms of change and developing the promotional strategies that will persuade people to change.

The Northern part of Machakos district is a marginal agricultural area that in times of drought is easily hit by misery and famine. Part of this area was earlier set aside as communal grazing land, but population pressure has opened the area in recent years for quite intensive settlement and the signs of environmental decay and erosion are now evident throughout the area. As a part of the emergency

assistance following the recent drought, water and sanitation demonstrations were built at the primary schools and the sanitation study through school children involved eight school classes in the district. Some of the information gathered in this exercise confirmed previous beliefs: the importance of the schools as centre of development information, the discrepancy between the acceptance of development facilities and their actual use.

The importance of fear was one of the most striking findings, fears associated with black magic (35%), fear to be alone (14%), fear of snakes and other animals lurking in the latrine (86%), fear of falling into the pit (56%), fear of smell, fith and insects (40%), and just shame to be seen. It was not the lack of knowledge, but anxieties that made the children avoid the latrines. Neither was it the lack of access to latrines that caused this: all had access to latrines in the schools and even of those who had a latrine at home as many as 25% never used it. Those who had to clean their own latrine at home preferred to use the bush instead. The emphasis on health education may reinforce this trend, because talk about disease in relation to latrines may increase the fear-factor and actually discourage the use of latrines. Equally interesting was the finding that neighbours' latrines are never used and that neighbours are not asked to help in the construction of latrines. Where mutual self help is a cornerstone in low income housing, it does not seem to apply to the taboo area of sanitation. In this poor area it was interesting to note that as much as 52% of the latrines had been built with the help of craftsmen.

Health workers and the schools were equally important as sources of information about sanitation. Cleaning of latrines has been well accepted as a part of the use, -61% clean it at least once a week- but there is little understanding about the role and behaviour of flies. While 63% complain about insects in latrines, as many as 71% do not use any cover over the latrines opening. The response of the whole group indicated an eagerness towards development. But change without motivation cannot receive any popular support. Modernisation in itself is appealing, but it must have a rationale, even for children. Proper social behaviour

that will carry the approval of the community is one factor that counts. A latrine that is safe, gives privacy, does not smell, does not house insects or snakes and bats, a latrine that looks nice and modern, that is convenient and clean, that is permanent and strong and that is simple to maintain and use is an acceptable latrine. The knowledge that it improves the health may be appreciated in the future, but is irrelevant now. The fact that it does not offend the neighbour and that it is a key factor to win approval from other community members is more important than the conventional wisdom that it will improve your health.

Conclusions

In this region sanitation is a particularly sensitive area and so far sanitation programmes have been much more successful, as construction programmes, than as improvements in environmental health. Much of this failure is related to the use of wrong communication channels, i.e. short-term health education programmes during the construction phase. The long-term success cannot be achieved if education approaches at all levels are ignored, which included child-to-child communications, extra-curricular activities and even child-adult communications.

Much of this can be achieved within curricula. There is sufficient scope for environmental education within the primary school subjects of science and health. It is therefore suggested that the cooperation of the educational authorities in the East and Southern African region will be sought to develop educational material in the field of water and sanitation, textbooks, exercise books, extra-curricular activity programmes, and community self-surveys. This implies a review of the existing activities and educational programmes in this field in the region, and the testing of experimental surveys and sanitation information programmes involving primary schools as a parallel activity to planned water and sanitation projects. It would involve the exchange and review of experiences between the countries in the region and the discussion of implementation strategies that focus on the educational and behavioural aspects of development.

The experiences from Machakos suggest that many of the conventional assumptions about the proper implementation of sanitation programmes are erroneous and that the poor results of such programmes can be explained in terms of traditional beliefs and established concepts which stand in conflict with the promotion arguments put forward by the sanitation projects. It also suggests that communications with children is a neglected area in the efforts to promote human settlement development and environmental care. Primary schools should therefore receive more attention as centres of social behaviour and be used to install patterns of behaviour that conform to the long-term development aims of society. Educational programmes that go beyond the narrow constraints of academic knowledge and that promote developmental change will help the future generation to make choices and set priorities towards progress and community emancipation.

8

BASIC DEVELOPMENT EDUCATION IN ETHIOPIA*

In the south east administrative region of Bale, Ethiopia, some 800,000 people, or 75% of the region's population, were dislocated due to ravages of war and severe drought during 1977-78. Shortly after the displaced were received in shelters at suitable locations, they were mobilized to organize themselves to fully share and even take the major role in the endeavours for relief and resettlement operations.

In the meantime, all regional branches of the national ministries and specialized agencies including the armed forces and police found themselves working together hand in hand in the relief and rehabilitation efforts, and the sectoral boundaries vanished in the emergency situation. The regional authorities operated with considerable autonomy and with adequate backing from the national headquarters. When the relief and rehabilitation efforts were eventually phased out, the rural population of the region resumed normal life mostly in settlement villages organized in peasant association cooperatives.

The area-based integrated approach for the provision of basic services commenced in Bale during 1982 with special focus on water supply, basic health care, improvement in the condition of women, mobilization of communities for self-help programmes and proper utilization of services. Basic education was made a catalyst of central importance in these area-based projects.

One of the early prototype settlements was Hora Boka, about five kilometers from the town of Robe, where five hundred families were resettled. A basic education centre was established here in early 1980 after the necessary

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pre-implementation survey was conducted. The centre which was set up by the Basic Education Panel of the central ministry in close collaboration with the Relief and Rehabilitation Commission had the primary aim of raising the level of consciousness of the settlement population in order to better prepare themselves for organizing and administering educational and self-help activities. The centre was also planned to serve as a bridge between the sectoral inputs provided to respond to relief and rehabilitation needs.

In this community-based project, an education committee consisting of the representatives chosen by the settlers from the peasant association leadership was responsible for local-level implementation. A liaison unit at the regional level with periodic guidance from the Panel was assigned the responsibility for the coordination of inputs from branches of developmental ministries. A small subsidy was given for the starting of the centre, and a monthly allowance was provided for the first 15 months. Community participation was made a crucial factor for both basic services and basic education.

Soon Hora Boka settlement was consolidating its gains and developing further. One hundred houses and compounds were improved. This included vegetable gardening, improved house partitioning, separate housing for cattle, the planting and construction of pit latrines. Nineteen women were trained in home management and assigned to the demonstration centre for proper follow-up of improvement of activities.

Income generating activities like vegetable growing, bee-keeping, sewing and knitting, crafts and soap-making have substantially benefitted the community. A livestock and dairy project started with a loan from the Agricultural and Industrial Bank is developing fast. A grain ware-house is constructed.

A Community Health Agent (CHA) and Traditional Birth Attendants (TBA) are trained and equipped with basic supplies and are serving the community. The improved stove production and dissemination is in progress for some time now.

A child care centre with a trained instructor and an assistant from the community caters for 150 children, the first generation to have such a priviledge in rural Ethiopia.

Four hectares of land are cultivated to support this day care centre. A primary school is established which is also maintained and supported with income from another four hectares of land.

Like Hora Boka, other settlements too have grown into well established productive communities where cooperative action and self-reliance are becoming tradition, and basic education and innovations have greatly improved the quality of life.

Development processes, however, are not an easy ride all the way. In many instances basic education generated rather strong repercussions. When over-enthusiastic young people began to ambush and break the jars of traditionally minded women who preferred fetching water from rivers and unprotected springs, it was insinuated by some people that basic education was the cause for the irresponsible act.

Attitudes and practices changed of course. When hand-dug wells and lifting pumps broke down and became non-operational, the women refused to fetch water from distant rivers and ponds. Husbands responded by loud protests accusing development agents and basic education for deliberately spoiling their wives.

What is this basic education which is blamed for every new phenomena?

Essentially, it is a learning-working process for the betterment of communities at grassroot levels through enhancement of their participation in development efforts. Within the Ethiopian context, the main features were promotion of self-reliance, various training and educational activities, health and sanitation, income generating activities for women, and introduction of various types of appropriate technologies. The approach was to hold frequent and unstructured dialogues with the development committees of each cooperative to reach concensus on priority needs, to foster the recognition that the communities themselves have a major role in improving their own lot and in solving problems essentially with available means and capabilities. To aid in the process, token amounts of cash subsidies and basic hand tools were provided to trigger action.

During the basic education dialogue and discussion sessions, usually conducted under the shade of a tree, the peasant development committees often opted for ambitious projects. In such cases, basic education officers and development workers resorted to patience and further dialogue. If a newly established community wanted a school, they were not thwarted directly. Instead, they were asked if they could afford the running cost, which of course they could not. They were then encouraged to identify productive activities with potentials for self-sustenance and income generation. The concensus on horticulture in one such case occasioned the introduction and growth of several types of vegetables.

Similarly, the installation of a grinding mill was identified and agreed upon as a priority project by virtue of its own necessity and as a means for supporting the community's educational need. Assistance was then made available including cash subsidies for fuel requirement. The newly installed service became a dependable source of steady income. It was convenient and accessible to other communities in adjacent areas. The majority of users paid in cash for the service, and the few who could not afford paid with their labour in the mill. A small chicken farm was started as a spin-off and the waste in the ground of the mill was carefully collected for feeding the chickens. Eventually, the steady income from the mill and chicken farm made it possible for the community to establish and run a school.

In another case when mothers in a new settlement decided to have a kindergarten, it was agreed to develop horticulture first as a means for generating income, and all women volunteered to work on the vegetable plots. It was then found out that there was not sufficient water and a major construction work had to be undertaken from a distant natural spring to the settlement. After more re-evaluation, it was decided to go ahead with the project in cooperation with neighbouring settlements who were having similar problems of water shortage.

As it happened, the concerned communities had to overcome a number of hurdles before they finally attained their objectives. The first of these was the demand of the water

works people to receive the cash subsidy alloted for the project on the ground that it is more efficient to use unemployed labourers and save the peasants' time for productive work and for literacy classes. This was resolutely opposed by the settlement's development committees who had begun savouring self reliance and managing their own projects. The final decision from the regional authorities favoured the prime objective of creating development consciousness among the communities. And so the development committees of the peasant associations mobilized the required work force and carried the project to a successful conclusion, with the support and expertise of the water works authorities.

Basic education became the catalyst for the revitalization of settlement communities at grassroot levels to enable people to develop initiative, self-reliance and a welcoming attitude to changes and innovations for social, economic and cultural betterment.

When more and more ambitious programmes kept coming up from grassroot levels, some of the regional branches of the specialized agencies labelled basic education the "basic problem" and complaints were heard in clichés like "these projects are not according to our plan"; "we were not consulted about these"; "we did not know about such and such"; and so on. There were also allegations that education was a concern of only one ministry. But the communities kept pushing for more basic education. So the basic education supervisory team changed the name to "basic development education" to facilitate acceptance by all agencies concerned and to assure the continuation of the integrated basic services.

Basic Development Education is a type of education provided to communities to enable them to start and administer their own basic social services using, as much as possible, locally available resources. Appropriate technology (basic technology) is one of the components of Basic Development Education.

In its comprehensive form basic development education includes day care centres for children, establishment of regular schools, organizing literacy classes and radio listening forums, promoting training of local artisans,

craftsmen, health, sanitation and agricultural workers, etc. The self-help activities range from construction of reading rooms, community centres, feeder roads, spring protection, improvement of home environment to a variety of income generating endeavours like vegetable growing, bee-keeping, knitting, weaving, pottery, soap-making and similar activities.

There are now more than three hundred grassroot level BDE centres set up mainly in the resettlement areas by the Basic Development Education Panel in collaboration with the Relief and Rehabilitation Commission. Some 160 of these, like Hora Boka, are established in Bale while lesser numbers are located in Gamu Goffa, Gojam and Wollega. All have come a long way from the first experimental BDE project that was started in 1976 at Gode and Kalafo in the Ogaden.

9

TOWARDS CHILD SURVIVAL AND DEVELOPMENT THROUGH ENVIRONMENTAL AND POPULATION EDUCATION*

Introduction

Issues of environmental awareness and population growth have never been as critical to all aspects of development as they are today. Indeed any development programme that omits considerations related to these two areas of human concerns is not only incomplete but also it is a recipe for future damages, costs and regrets.

Happily for all environment-conscience people the international community at large has recognized this. The inauguration of the United Nations Environment Programme (UNEP) by the United Nations General Assembly for example, is evidence of an encouraging start. This international initiative has been emulated at national level by the establishment of ministries, government departments and institutes dealing with environmental aspects of development.

Starting with such co-ordinating bodies, programmes have been initiated that do give a practical orientation to the existing environmental related institutions. In addition, we see encouraging indications when we note that environmental dimensions are being increasingly integrated in training programmes such as those of administrators, industrialists, business executives, extension officers and engineers.

Turning to population, this is an area that has received more attention dating as far back as the biblical days. In those days when empires rose, grew and decayed the growth

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of population was as important as it was critical to the state. The population was a source of revenue in taxes and slaves; it was a reservoir of potential soldiers too. Given such considerations, the unabated growth of any population was indeed a most desirable thing for any chiefdom, state or empire.

Today, technology and a more comlex economic order have combined to make such considerations obsolete. In the modern world environmental degradation, land shortage, poverty and hunger, high infant mortality rates, ignorance and disease are aspects that have been blamed on uncontrolled population growth.

In the world of today we like to take these as more important considerations, albeit of a negative nature, than any of those that might have prompted governor Augustus Caesar to order a census of Hebrews.

Given these observations, it was a remarkably foresighted decision on the part of the organisers of this Regional Seminar to incorporate an environmental and population component into the Seminar's general theme of Basic Education for Child Survival and Development (CSD). We believe that the success of the Child Survival and Development Revolution (CSDR) will to a great extent depend on how this revolution equips both the child and the parent with the skills and information tools that enhance CSD. Such success will also greatly depend on how the relevant enforcing agents of development programmes, not least in the field of education, grapple with environmental and population hurdles of today and tomorrow. Basic education, on its formal and non-formal fronts, offers much scope for meeting these conditions for CSDR's success.

On these premises we shall proceed to:

- examine population and environmental problems relating to the African situation;
- identify the role that basic education can play in alleviating these problems;
- and point out the curricular implications of both formal and non-formal educational systems for CSD.

Environmental Problems Facing Africa: A Brief Overview

An environmental problem is any undesirable aspect posed by our physical surroundings or any undesirable man-induced alteration in these surroundings. The total environment is made up of many sub-components which do interact in a complexity of ways. There is the interaction of the physical components and the biosphere for the survival and growth of the flora and fauna. There are also the interactions between man on the one hand, and the physical and biological components of the environment on the other. The essence of these latter interactions is satisfaction of basic needs, such as food, clothing, shelter and leisure.

Out of all these interactions among environmental components and sub-components arise environmental problems that fall into three broad categories classified on a causal basis. The three categories include those caused by interactions within the natural environment, those caused by poverty, and those caused by underdevelopment.

Poverty is a situation whereby an individual or a social group such as family is inadequately endowed with the means of obtaining the basic necessities of life and health. This situation is common in Africa where the majority live below poverty line.

Underdevelopment on the other hand is a problem of national economics. It is a culmination of poverty as defined above, in that a largely poverty-striken population is unable to sustain steady economic development. Consequently the economy as a whole is characterised by low per capita GNP levels, a low level of productive investment, over-dependence on subsistence production, mainly of a primary nature, a large proportion of dependent age persons, and a disproportionate allocation of national funds to provision of social services.

Poverty and underdevelopment constitute a self-reinforcing viscious circle which is difficult to break.

As African countries try to break the cycle of underdevelopment, they are forced into a situation of

indiscriminate exploitation of natural resources. The consequences have been serious for the natural environment and the population that depends on it.

The Role of Formal Basic Education in Alleviating Environmental Problems

This paper argues that basic education has a critical contribution to make towards CSD. We are also committed to the idea that environmental and population considerations are essential in any meaningful basic education curriculum on the continent.

It is not our intention to delve into the justification of the above stated position at this stage because we believe it is not necessary in this particular forum. What we propose to do is to nighlight a few considerations regarding how environmental education and population education can be perceived and handled within the framework of basic education curricula.

Curriculum developers must be cautioned in that environmental education must be truly integrated as distinct from mere inclusion of environmental aspects in otherwise traditionally structured curricula. They must therefore be clear as to what the difference is between linking and fusion in curriculum development.

In order that basic education teachers be able to prepare and teach proper environmental education and population education oriented lessons, they must be guided by appropriate curricula.

Curriculum development is the most critical step. In view of this, African governments must re-examine their whole curriculum development perception and procedures. Five years or so ago, any national curriculum development body could point to the lack of resource material to guide them in developing environmental education-oriented curricula. Today such a claim is indefensible. Periodicals, books, research papers, seminar proceedings, etc. are now in considerable supply. In addition, international bodies like Unesco, UNEP,

the African Curriculum Organization (ACO), the African Social Studies Programme (ASSP) and many higher learning institutions are only too willing to lend a helping hand to government departments in their curriculum development endeavours.

A Unesco publication, "Trends in Environmental Education" (1977), features a list of some organizations co-operating in environmental education. Participants are encouraged to distribute the list to curriculum developers, ministry of education inspectorates, teacher training institutions, adult education authorities, and any other institution related to education in their home countries.

The third requisite for the success of environmental education in formal basic education is the creation of an inventory of appropriate teaching materials. J.M. Akintola (1982) while discussing the "integration of environmental education with science and mathematics curricula" presents the following "brief list of some of the materials and sources for environmental education". We envisage that teachers of other curricula will find much relevance in this list to their respective disciplines. The list runs as follows:

- specimen from the local environment
- written materials of all types
- locally produced low-cost equipment and aids
- film strips and slides
- library facilities
- broadcast and pre-recorded materials
- publications from local institutions and national bodies
- museum facilities and collected or preserved items.

To this list we can add videos and television, where these can be made available, and such materials as models and charts, preferably those prepared by the students themselves.

At the implementation stage, that is, in the classroom and the school in general, learners' participation should be won in such a way that the learner assimilates the facts relating to the problems, understands the conceptual issues involved, and also, more or less spontaneously, develops a continuing sense of concern and commitment to studying (and solving) the problems.

Environmental Education in Non-formal Education

In Africa the three salient fronts of non-formal education have been:

- pre-school education: this includes the nursery school, kindergarten, and pre-primary courses.
- out-of-school youth: here emphasis has been on clubs and vocational training.
- adult education: this front has, in many cases, tended to concentrate on literacy.

Of all these, the last has been the most pronounced on the continent and it has attracted significant publicity in development plans as well as state information media. It has thus lured significant financial support from national government as well as international organizations, especially Unesco.

Pre-school education, on the other hand, has been a largely urban phonemenon. In rural areas where affluence and therefore demand for nursery schools are lacking, children have tended to proceed to primary education straight away.

Out-of-school youth education programmes are even more limited on the continent. Where they exist they have widely diverging goals ranging from cultural activities to political ones.

The place of environmental education in pre-school education

The pre-school is an ideal stage for starting education for CSD in general and environmental education in particular. The toddlers are at a stage where in general they develop most of their final adult physio-neurological capacities. It is a stage where they learn by "continuous construction and reconstruction of experiences, and acquire a series of responses organizing and re-organizing them as necessary". (J. Ailes, A. Chiba -Unesco, 1977). These responses usually develop under adult and peer influences in the family, the village, and at the nursery school. In urban affluent circles, cinema, television and the printed word equally contribute towards this development.

Such a formative stage of human development is probably the most ideal for introducing environmental education. If, at this stage, the children are made to appreciate environmental problems of immediate relevance to them individually, as a child population and as members of families, much will have been achieved. We shall have laid a firm foundation for future development, maintenance, and exploitation of good responses acquired in the formative years.

There are many practical ways of infusing environmental awareness, as well as attitudes favourable to environmental conservation and improvement, personal hygiene, community health and other attributes of relevance to CSD. Infant and child educationists could do well to utilize the very methods common in the urban nursery school, rural Sunday schools, Koranic schools, etc. These include direct instruction, music, drama, art, play, passage memorization, etc.

Youth education as a vehicle for environmental education

As David K.J. Withrington (Unesco, 1977) observes, "school environmental activities are a valuable extension to formal education at all age levels, and are of special importance for those who have limited access to school education". In Africa, and the rest of the third world, a situation exists where most of our youth have not seen the inside of a

classroom, and quite a number have, for various economic and cultural reasons, dropped out of formal basic education at early stages. If such people are not to become a heavy social and economic burden to their countries, ways and means must be devised to further their education outside the school; non-formal youth education would seem to be the nearest alternative.

In the past, youth activities in Africa have been dominated by cultural groups and party youth wings. In addition, authorities in agriculture have initiated youth activity through young farmers groups. While the culture youth groups have mostly been at such local levels as the village and parish, youth wings and young farmers groups have tended to have a wider regional and even national outlook. Most unfortunately, their activities have been limited in scope and rarely have they explicitly and visibly engaged in, or been exposed to, environmental education.

It must be recognized that it is the youth that are on the verge of being parents on whom child survival will greatly depend. Educating them on all major concerns of environmental education, such as health, hygiene, child care, home management, conservation, etc. is to invest in the immediate future for the benefit of tomorrow's society.

To date we have not seen such practical utilization of youth groups. Emphasis has commonly been on immediate individual benefits for participants in youth activities, very much at the expense of long term societal benefits like child survival and conservation.

This characteristic absence of re-oriented youth education/activity programmes in most African countries is often explained in terms of lack of adequate finance, manpower and infrastructure to facilitate such programmes. What then can be done to salvage the situation? I would like to suggest the following as practical, though partial, solutions to the problems of resource inadequacy.

Finance: Fund arising campaigns led by local politicians, religious leaders, age-groups leaders and other opinion leaders in the manner of Kenya's Harambee (pulling together) spirit can raise a substantial amount on a purely voluntary basis. As the Kenya case will bear this out, once a spirit of self-help voluntary fund-raising is established, it becomes not only an obligation to the citizenry, but very much a way of life.

Manpower: The nearest option is to use the many school leavers available to propagate the knowledge that they will have acquired through environmental education in formal education. Already a large number of school certificate and advanced levels students opt for teaching jobs while waiting to join the next level of education. We can also use in-school students especially those at higher levels for the benefit of their less fortunate peers. Alternatively a new concept of extra-mural studies for local youth may be investigated. The open university, a concept developed in the United Kingdom, could also be utilized.

Infrastructure: Here I suggest that African education ministries investigate ways and means of utilizing the available educational infrastructure more fully. In most Commonwealth countries schools are closed for holidays for as much as four months in a year and universities even longer. In all these months the bulk of the education infrastructure lies idle. Only occasionally, when a neighbouring city or town hosts a big seminar is such infrastructure utilized, mainly to provide meeting rooms and accommodation. We can "give the school back to the community, and bring the community into the school", (A. Eichler/Unesco, 1977) by keeping school facilities in use over most of the year for the benefit of youth activity/education.

Environmental education in adult education

Until the late 70s adult education tended to be viewed as synonymous to adult literacy campaigns. There was very little co-ordination of these campaigns and long-standing hygiene and health education programmes that have been run by hospitals and health extension staff or with agricultural education programmes. As a result of this lop-sidedness most literature reporting achievements in adult education highlights the numerical proportions of the population that have been saved from illiteracy.

Due to the involvement of non-governmental organizations and international bodies such as Unesco, UNEP, UNICEF, etc., attitudes have changed considerably in the eighties. As Lenor A. Armstrong (unpublished) observes, "Literacy is no longer considered an end in itself but rather as a tool to acquire information to improve one's living standards. The literacy teaching materials cover various socio-economic issues. In most countries agriculture and related issues, health care and nutrition, family life, including birth control are amongst the topics presented to literacy groups".

However, these are independent individual subjects using the adult literacy class a common vehicle. In order to facilitate a new approach to youth/adult education we have to analyse and classify types of education programmes involved here. Put in a nutshell the new approach to adult education must show more linkage in the classifications listed above; it has to emphasise general and specific environmental themes; it must recognize the need to actively involve adults in environmental action; and it calls for a revision of adult education, development of new environment-oriented teaching materials and a more intensified use of the media.

Adults are the primary and most critical agents of CSD. Mothers, for example, need to know the importance of and ways of implementing the key elements for CSD, viz, antenatal care, maternity care, monitoring child growth, prevention and treatment of dehydration diseases, child feeding and immunization. Fathers, on the other hand, have to be educated on their responsibilities in providing the means and atmosphere that enable mothers to provide these key elements to both mothers and child.

On being born, the child needs support and protection in form of the key elements for child survival which we discussed earlier. Ideally such support should be ensured by educating male and female adults together. The barriers to this suggestion are largely cultural. In Kenya, for example, several ethnic groups consider such an adult education rather insulting to the man's ego. Also men do not take a liking to a situation where women beat them at "academic" performance. The result has been that a disproportionate majority of participants in adult education classes are women. One of the consequences of this problem of attitudes is that important messages of value to conservation, health and CSD, for example, never reach the implementation stage that they are intended for, simply due to lack of co-operation from menfolk.

There is no single tailor-made remedy to this situation, but a combination of the following measures would go a long way to help:

1. Running separate unisex adult classes;

2. Limiting measurement and evaluation of learners' achievement to an individual level and avoiding publication of results beyond informing the learner individually;

3. More extensive use of the media available for adult education so as to further learning at home;

4. Increasing community participation in public projects, especially those of environmental health.

Population and CSD: An Overview

If we are to grasp the importance of population education as a problem-solving strategy in CSDR, we have first to identify Africa's problems that are related to population. Then we have to relate them in turn to CSD. Such problems fall into three aspects of population study, that is:

- size,

- distribution, and

- characteristics.

None of these aspects poses its own problems inherently. Rather, problems arise in as much as each of these aspects impinges on resource creation, allocation and management.

The relationship of fertility, mortality and population growth is described by the demographic transition model of R.H. Cassen (1973). This model is characterised by four stages of transition from a stable population with high birth rates and high death rates, to a stationary population when both rates are steadily low. Problems of population growth arise during stage 2. Here death rates decline rapidly as improved medical facilities reduce infant and child mortality and increase general life expectancy. Since birth rates are not proportionately reduced total population increases tremendously, usually above 2.5% per annum. Kenya, for example, has reached a 4% level. As is typical of less developed countries in Africa, this growth tends to outpace economic growth. Results include general economic decline in real terms and this may cause food shortage.

On a family level, high fertility reduces adequacy of food intake as is illustrated in table A below. This trend will, in turn increase the incidence of malnutrition and child disease, a situation depicted in table B.

Table A: Adequacy of Food Intake by Family Size

Family Size	Adequacy of Intake	Shortage	Total
1-3 children	74.5%	25.5%	100%
4-6 children	68.1%	30.9%	100%
7-9 children	64.7%	35.3%	100%

Table B: Effects of Malnutrition

Nutrient	Effect of Deficiency
Carbonhydrates	Loss of weight, acidosis
Certain fatty acids	Skin disorders (Eczema)
Protein	Kwashiorkor, Anaemia
Vitamin A	Xerophthalmia, Blindness
Thiamine (B1)	Beriberi
Nicotinic Acid	Pellagra
Riboflavin (B2)	Vascularization of corcum, corneal infection, chelosis, angular stomatitis
Vitamin C	Scurvy
Vitamin D	Rickets
Vitamin E	Sterility, eye abnormalities
Vitamin K	Failure of blood clotting
Calcium	Rickets
Iron	Anaemia
Iodine	Goitre

Most rural African population structures are characterized by a large proportion of the population being children and therefore unproductive dependents. A situation of this nature puts great strains on government resources as most of them are diverted to education and health. That leaves little money for directly productive investment. That is partly why economic growth in Africa has remained low.

The Role of Population Education in Alleviating These Problems

When we examine the way population education can be incorporated into basic education curricula we see many parallels with environmental education in approach and strategy as well as usefulness in promoting CSD.

For example, Rugumayo's model of environmental education has attributes that are equally applicable to population education. Therefore population education should not be seen as an independent additional subject to already crowded education curricula. It is an innovation, a new approach intended to produce a self-protecting and society-conscious individual. Its goal is:

> *To effect the development of attitudes and behaviour that will make learners want to adopt fertility patterns in consonance with their own moral values and social responsibilities on their own accord and decision, when they become parents (Unesco, Bangkok, 1985).*

Curriculum developers have to keep in mind the important attributes of population education: its problem-centred nature, the multidisciplinary approach, etc. which we discussed earlier on. Rather than dwell on these again, I shall devote attention to the implementation strategies in the classroom, in the adult class, in the field and other learning forms. No distinction is made here as to whether a lesson is in the formal or in the non-formal realm of education. Emphasis is laid just on strategies of imparting population education as suggested by Unesco's Regional Office for Education in Asia and the Pacific.

In order to be able to competently handle population education in our curricula, it is necessary that teachers and learners develop at the outset a clear and systematic conceptualization of what population education involves. This is known as the conceptualization strategy.

Let us review a specific example of such a strategy, which was designed by Hilde Taba (1970). Her approach involves three main activities, namely listing, grouping and labelling in that order.

1. LISTING: Items associated with the term population, those that affect population and those that are affected by population are enumerated and noted.

aging
birth (fertility)
birth control
birth planning
contraceptives
child spacing
education
employment
environment
family planning (information and communication and service delivery)
fertility control/ regulation
food and nutrition
health
housing
human physiology
human reproduction
increase or decrease in family members and number of people in a community (population change)
IUD (intra-uterine device)
miscarriage
marriage (nuptiality)
movement of people/ change of residence (migration)
condom
death (mortality)
demography
disease and illness of people (morbidity)
economic development
number of people in a given area (density)
planned parenthood
people moving to cities (urbanization)
pills
population change
population education
population studies
pregnancy
pre-marital sex
rate of population growth
resources
rhythm method
sex (sexuality)
sex education
sterilization
tubectomies
teenage pregnancy
vasectomy
young and old/male and female (composition)
zero population growth

2. **GROUPING**: Also called classification, involves putting together into clusters those terms which appear to have common aspects, as is shown below.

Group 1:

aging
population change
population composition
fertility
migration
morbidity
nuptiality
rate of population growth
family/population size
urbanization
zero population growth

Group 2:

economic development
education
environment
employment
food and nutrition
health
housing
resources

Group 3:

conception
birth planning
human physiology
human reproduction
pregnancy
pre-marital sex
sexuality
teenage pregnancy

Group 4:

birth control
child spacing
condom
contraceptives
fertility control/ regulation
IUD
miscarriage
planned parenthood
pills
rhythm method
sterilization

Group 5:

demography
family planning (IEC and service delivery)
population education
population studies
sex education

3. LABELLING: Crystallizing the groups by naming their individual common aspects is called labelling them; this is shown below.

Group 1: Population situation/demography
Group 2: Quality of life themes
Group 3: Human reproduction or sex education
Group 4: Family planning
Group 5: Population groups

Summary and Conclusion

This paper set out to examine the ways in which environmental and population education in basic education curricula can enhance CSD. We started by summarizing the environmental and later population problems facing Africa, and their main causes. We outlined the various ways in which environmental and population education can help alleviate some of these problems. It was then argued that basic education, whether formal or non-formal, is the best starting point in implementing environmental and population education programmes.

To facilitate this, our planners must perceive the concepts of environmental and population education as dimensions of general education and recognize their positive attributes. We have gone to some length to demonstrate these attributes and their relevance to development in general and CSD in particular.

The second step is to design a proper curriculum development programme. We have made reference to various co-operating organizations that can help African curriculum developers in this task.

For the environmental and population education curricula to be well implemented, the paper has called on education authorities in Africa to undertake comprehensive manpower development programmes by training and re-training basic and adult education specialists so as to prepare them to

handle environmental and basic education properly. UNEP and other organizations can help by providing or designing suitable models for this.

We have also offered some guidelines to teachers on how to fuse environmental and population education in classroom and other learning situations.

All along the paper's underlying theme has been to urge approaches that enable:

a) teaching from the environment

- preferably a progressive process from known to unknown and from the particular to the general;

b) teaching about the environment

- a more or less descriptive approach to inform learners about their environment and to provide them skills to discover for themselves further such information;

c) teaching for the environment

- imparting such knowledge, skills and attitudes that enable the learners to appreciate the relationship between resources and the environment as well as the link between the environment, on the one hand, and life and health, on the other.

Already encouraging though simple beginnings have been observed in Africa in the two areas of environmental and population education. Also a lot can be learnt from experiences in Asia and the Pacific, where close liaison with the Unesco Regional Office for Education has brought countries of divergent social, religious and ideological inclinations together in search of solutions to environmental and population problems. There is every good reason for African countries to build on their own humble beginnings and on lessons from outside the continent.

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* *Exists in French*
** *Exists in French and Spanish*